CHAPTER 3

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

ARIZONA SNOWBOWL

Coconino National Forest
Peaks Ranger District

3. THE AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

CEQ regulations direct agencies to succinctly describe the environment that may be affected by the alternatives under consideration.[1] As such, Chapter III describes the existing physical, biological, social, and economic components of the project area which have potential to be affected by implementing any of the alternatives (i.e., the Existing Conditions). Each Existing Condition description is followed by an Environmental Consequences discussion that provides an analysis of the potential effects of implementation of each of the alternatives.

Chapter 3 is organized by resource area, and follows the organization of significant and tracking issues as presented in Chapter 1. Each resource section in Chapter 3 is organized in the following order:

SCOPE OF ANALYSIS

The scope of analysis briefly describes the geographic area(s) potentially affected by the alternatives for each issue and its indicator(s). The scope of analysis varies according to resource area and may be different for direct, indirect, and cumulative effects.

EXISTING CONDITIONS

The Existing Conditions section provides a description of the environment potentially affected, as based upon current uses and management activities/decisions.

DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES

This section provides an analysis of direct and indirect environmental effects of implementing each of the alternatives, according to the issues and indicators identified in Chapter 1. Cumulative effects are discussed separately.

Direct effects are caused by the action and occur at the same time and place.
Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable (i.e., likely to occur within the duration of the project).

CUMULATIVE EFFECTS

Cumulative effects are the result of the incremental direct and indirect effects of any action when added to other past, present, and reasonably foreseeable future actions, and

[1] 40 CFR 1502.15

can result from individually minor but collectively significant actions taking place over a period of time.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

An irreversible commitment is a permanent or essentially permanent use or loss of resources; it cannot be reversed, except in the extreme long term. Examples include minerals that have been extracted or soil productivity that has been lost. An irretrievable commitment is a loss of production or use of resources for a period of time. One example is the use of timber land for a logging road. Timber growth on the land is irretrievably lost while the land is a road, but the timber resource is not irreversibly lost because the land could grow trees in the near future. The Forest Service recognizes the fact that certain management activities will produce irreversible or irretrievable commitments of resources.

FOREST PLAN CONSISTENCY

In conjunction with each resource analysis presented in this chapter, a thorough review of the Forest Plan was conducted in order to determine consistency with standards and guidelines at the Forest and management area levels on the CNF. The Forest Plan consistency analysis is contained in the official Project Record at the Peaks Ranger District. Aside from two components of the Proposed Action – snowmaking and snowtubing – the Forest Plan Consistency Analysis identified no inconsistencies in the Proposed Action. Therefore, as indicated in the Proposed Action description in Chapter 2, a minor, non-significant Forest Plan amendment is associated with Alternative 2. The amendment language can be found in Appendix B of this EIS.

3A. HERITAGE AND CULTURAL RESOURCES

SCOPE OF THE ANALYSIS

The scope of the cultural and heritage resources analysis within this document focuses on the cultural and spiritual values of the San Francisco Peaks, and the San Francisco Peaks Traditional Cultural Property (TCP), which is defined in the Existing Conditions discussion. The analysis area for the project encompasses the entirety of the San Francisco Peaks, with the understanding that the actual affected environment is far smaller, consisting only of lands within the SUP area (i.e., existing and proposed areas of disturbance). It should be noted that it is difficult to be precise in the analysis of the impact of the proposed undertaking on the cultural and religious systems on the Peaks, as much of the information stems from oral histories and a deep, underlying belief system of the indigenous peoples involved. Pilles,[2] in his draft National Register nomination, has noted that we "can only attempt to describe the major characteristics to which values are assigned that lead to an understanding of the deep, cultural meaning of the Peaks to the traditional people of the First Nations of the Southwest."

EXISTING CONDITIONS

NFS lands within Snowbowl's 777-acre SUP area have been utilized for winter sports and recreational use since 1938, when the ski area's original base area was established in Hart Prairie. Since that time, developed recreation at the Snowbowl has evolved with the creation of additional trail systems, buildings, lifts and infrastructure. Snowbowl's existing developed terrain network is comprised of 32 trails creating approximately 139 acres of skiable areas.

Vegetation breaks within the SUP area were cut throughout the development of Snowbowl; for the most part, vegetation breaks within the SUP area have been "feathered" and undulated in an attempt to mimic natural breaks in the vegetation across San Francisco Peaks. With the exception of the Hart Prairie area (approximately 40 acres), which is a natural alpine meadow, approximately 100 acres of overstory vegetation have been cleared throughout Snowbowl's development history.

LEGAL IMPLICATIONS

In addition to NEPA, there are a number of laws and regulations that apply to the proposed undertaking. These include the National Historic Preservation Act (Section 106), the Advisory Council on Historic Preservation regulations,[3] and the American Indian Religious Freedom Act. National Register Bulletin 38: *Guidelines for Evaluating and Documenting Traditional Cultural Properties* provides guidance in addressing the National Register eligibility of the San Francisco Peaks (defined below). The Forest

[2] Pilles 2003, section 10:1

[3] 36 CFR 800

Service has specific responsibilities under these laws and regulations and this Proposed Action is addressed in accordance with them.

The National Register of Historic Places (National Register) is the Nation's official list of properties recognized for their significance in American history, architecture, archeology, engineering, and culture. National Register properties include districts, sites, buildings, structures, and objects. They can be significant to a local community, a state, an Indian tribe, or the Nation as a whole.

A TCP is a place that is associated with the cultural practices or beliefs of a living community. Those practices or beliefs must be rooted in the history of the community and be important in maintaining the continuing cultural identity of the community. While not all TCPs are eligible for the National Register, a TCP is eligible if the property plays a role in a community's historically rooted beliefs, customs, and practices and meets one of four National Register Criteria for Significance: A) associated with significant events; B) associated with a significant person; C) is an outstanding example of a type; or D) is associated with information contained in an archeological site.

The Forest Service has identified the San Francisco Peaks as a TCP as defined in National Register Bulletin 38: *Guidelines for Evaluating and Documenting Traditional Cultural Properties*. The Peaks have also been determined eligible for inclusion in the National Register of Historic Places as part of the White Vulcan Mine Settlement Agreement and Mine Closure in August 2000.[4] The San Francisco Peaks are associated with cultural practices and beliefs of living Native American communities that are rooted in their history and are important in maintaining the continuing cultural identity of their community. It is common for those places considered Traditional Cultural Properties and used for religious purposes, to be nominated to the National Register of Historic Places.

Simply being on the National Register does not afford a property any additional protection. It merely gives the property formal recognition of its importance. Once a property has been formally determined eligible, it has just as much protection as if it were listed. As a result of the determination of eligibility, the Forest Service is required to protect the Peaks as if they were already on the National Register and consult with Tribes and interested parties regarding the impacts of proposed actions upon the Peaks.[5] At the time of publication of this EIS, the Forest Service is in the process of completing a National Register nomination form for the Peaks.

The San Francisco Peaks TCP contains all NFS lands in the area roughly bounded by Forest Road 418 on the north; U.S. Highway 89 on the east; and the boundary between CNF, state, City of Flagstaff, and private lands on the southern and eastern boundary of the Fort Valley Experimental Forest. The TCP boundary goes north to approximately the Transwestern Pipeline, then west to U.S. Highway 180. It then generally follows U.S. Highway 180 to its junction with Forest Road 418. It includes the San Francisco Peaks,

[4] USDA Forest Service 2000a

[5] Pursuant to 36 CFR Part 800 Protection of Historic Properties.

all peaks and ridges that form the top skyline view of the Peak, the Inner Basin, all springs in the Inner Basin, most other springs on the Peaks (except those on state, city, or private lands), Lockett Meadow, Weatherford Canyon, Mt. Elden, Little Mt. Elden, Schultz Pass, the Dry Lake Hills, Friedlein Prairie, Hart Prairie, and the Hochderffer Hills.[6] The Snowbowl SUP area is included in the National Register boundary.

ETHNOGRAPHIC LANDSCAPE

An additional issue that is often considered with National Register-eligible properties is that the Peaks may be considered an ethnographic landscape. Ethnographic landscapes, as defined by the National Park Service, are those landscapes containing a variety of natural and cultural resources that associated people define as heritage resources (e.g., small plant communities, animals, and ceremonial grounds). As such, ground disturbance to the landscape can impact its integrity, even if the disturbance does not occur in the specific area of ethnographic usage. For example, historic ground and vegetation disturbances within the Snowbowl SUP area have impacted the Peaks. These indirect impacts may have affected the entire mountain's spiritual character and the ability of rituals to be properly completed.

TRIBAL CONTACTS

San Francisco Peaks are of traditional cultural and spiritual significance to several Indian Tribes, including the Hopi, Navajo, Zuni, Hualapai, Havasupai, Yavapai-Apache, Yavapai-Prescott, Tonto Apache, White Mountain Apache, San Carlos Apache, San Juan Southern Paiute, Fort McDowell Mohave Apache, and Acoma. In an effort to provide tribes with an early opportunity to comment on the Proposed Action, consultation between the Forest Service and 13 tribal leaders was initiated in June 2002, with a formal letter from the Forest Supervisor. Also in June 2002, the District Ranger for the Peaks Ranger District contacted by phone, tribal representatives from Cultural Preservation Offices of 13 affiliated tribes to discuss the Proposed Action and suggest meetings. Phone contacts between the District archaeologist at the Peaks Ranger District and several tribal cultural preservation officers (Hopi, Navajo, Hualapai, San Carlos Apache, Yavapai-Apache) were made during the months of June-December 2002. In addition, follow-up phone calls to interested tribes were made by the District archaeologist to ensure receipt of letters. Overall, numerous phone calls and letters have been sent to tribes and the tribal public requesting input.

Additional tribal contact regarding the Proposed Action included a meeting with representatives from the Yavapai-Apache, an information booth at Tuba City Flea Market as part of the Western Navajo Fair, a meeting with the Hopi Land Team, two meetings with the Hopi Cultural Resource Advisory Team, attendance at three Navajo Chapter House meetings (Gap/Bodaway, Cameron, Leupp), and a meeting with the Western Navajo Agency Council. In addition to these contacts, two formal public meetings were held on the Hopi Indian Reservation (Tuba City and Kykotsmovi) on December 9, 2002.

[6] Pilles, 2003

The emphasis of these two public meetings was to explain the Proposed Action to tribal members and to elicit comments and concerns on behalf of individuals and the tribe.

CULTURAL BACKGROUND

The San Francisco Peaks are sacred to 13 tribes, but perhaps most importantly, the Hopi and Navajo, in addition to other tribes, are still actively using them in both historic and religious contexts. A central underlying concept to all affiliated tribes is the recognition that the San Francisco Peaks are a source of water in the form of rain, springs, and snow. It is believed that the Peaks were put there for the people and it is therefore the peoples' duty to protect it for the benefit of the world.[7] "We believe the snow that comes down the Peaks is like a human being or a spiritual deity that brings us water. Water runs throughout the body and nourishes us."[8] Pilles[9] identifies nine significant qualities that characterize the Peaks for the tribes. These qualities include:

1. They are the abode of deities and other spirit beings.
2. They are the focus of prayers and songs whereby humans communicate with the supernatural.
3. They contain shrines and other places where ceremonies and prayers are performed.
4. They are the source of water.
5. They are the source of soil, plant, and animal resources that are used for ceremonial and traditional purposes.
6. They mark the boundaries of traditional or ancestral lands.
7. They form a calendar that is used to delineate and recognize the ceremonial season.
8. They contain places that relate to legends and stories concerning the origins, clans, traditions, and ceremonies of various Southwestern tribes.
9. They contain sites and places that are significant in the history and cultural practices of various tribes.

Pilles also notes that most tribes acknowledge they have shrines on the Peaks, or specific places where ceremonial things are done, but they are reluctant to identify them for fear they will be disturbed or desecrated, as well as the fact that such places should not be visited by people unless they have the sufficient religious training and have made the appropriate preparations to go there. "They wanted indications of sacred sites on this mountain, and we can't say X and X are sacred sites on the east side, or the top is a sacred site. The Mountain was put there for the people, not just part of it, so it's our duty

[7] Id.

[8] Reid, 2001

[9] Pilles, 2003; Dine Medicineman's Association 1999; Western Navajo Agency, 1999; Hopi Tribe, 1975; Hopi Cultural Resources Advisory Task Team, 2002; Watson, 1964:22

to protect this place for the benefit of the world, for our people, and everyone else."[10] The Forest Service provides tribal access to the Peaks for the purposes of collecting plants, visitation to shrines, and other religious activities. The Forest Service is unaware of any specific shrines, trails, or sacred resources located directly within the Snowbowl SUP area.

The qualities listed above are manifested by the undisturbed appearance of the Peaks as a landmark upon the horizon, as viewed from the traditional or ancestral lands of the Hopi, Zuni, Acoma, Navajo, Apache, Yavapai, Hualapai, Havasupai, and Paiute.

Sacred sites play an integral role in Native American religions and, to some groups like the Hopi, cannot be disturbed or the spirits may leave. Native American religions often emphasize the natural world in its entirety; every part of nature contains sacred knowledge, and the relationship of man to every creature and place is one of kinship. The entire earth is sacred; it is seen as the source of life. Some parts of the natural world, such as the San Francisco Peaks, are accorded special reverence. These special places may be where gods originated or where they live or where individuals or leaders communicate with spiritual forces. Thus, the relationship between native people and their lands is central and indispensable to their religion, culture, and way of life.

The concept of landscape should be considered when discussing Native American relationships to the land.[11] Large areas such as mountains may be considered sacred preserves, with various activities occurring that relate to the culture and religion. While preserving places important to a group is important in helping preserve the culture, a more effective approach is to widen the focus by considering the culturally significant landscape within which each group functions and from which they derive their cultural values. In this regard, many groups consider the landscape to be part of a living cultural system, which encompasses both the people and the land together. The most sacred and significant places for Native Americans are those where there is a symbiotic relationship among land, religion and people - and the place is important in the creation/origin stories of the people. It is these places where shrines or offering places exist and cannot be moved and where ceremonies and rituals are carried out.

Developing a cultural understanding about the sacredness of a TCP is difficult within the parameters of a NEPA analysis. Pilles[12] notes that we can only attempt to describe the major characteristics to which values are assigned that led to an understanding of the deep, cultural meaning of the Peaks to the tribes for which they are sacred.

Two examples of a symbiotic relationship with the San Francisco Peaks are the Hopi and Navajo people, as discussed below.

[10] Kiefer, 1998
[11] Kelley and Francis, 1994
[12] Pilles, 2003

Hopi

Hopi clans migrated through the San Francisco Peaks (called *Nuvatukyaovi*, - "Place of Snow on the Peaks"), made settlements nearby, and placed shrines on the Peaks to serve as places of worship. All of the religious ceremonies encompassed within *Nuvatukyaovi* demonstrate the sacred relationship of the Peaks to the Hopi people. The history of clan migrations through the area continue to be related, discussed, and passed on from generation to generation. The Peaks contain clan and society shrines, and several significant gathering areas for medicinal and religious use. Hopi priests continue to visit the Peaks. The San Francisco Peaks are the spiritual essence of what Hopis consider to be among the most sacred landscapes in Hopi religion, the spiritual home of the *Kachina*, significant religious deities that all Hopis believe in, and are therefore, sacred. The ceremonies associated with the Peaks, the plants and herbs gathered on the Peaks, and the shrines and ancestral dwellings located on the Peaks are of central importance to the religious beliefs and practices of the Hopi people.[13]

Kachinas represent the multi-layered spirit powers who personify nature: clouds, sky, storms, trees, etc. They function as protective supernatural beings who can help humans if they are asked properly and respectfully. They also represent the spirits of good people who die and become clouds, bringing much-needed rain. They serve as entertainers and disciplinerers of children, look after the interests of humans, serve as intermediaries to the gods, and can bestow good fortune, such as fertility, power, and long life.[14]

The Hopis possess a large number of Kachinas, which can number in the hundreds at any one time, and are constantly changing. Kachinas visit Hopi villages every year, beginning in February after descending from their home on top of the San Francisco Peaks. The top of the Peaks is considered to be an oomawki, a cloud house, since the *katsinas* are manifested as clouds.[15] There is a kiva for the *katsinas* on the very top of the Peaks[16] and the Kana-a Kachina, for example, lives in an ice cave on top of the Peaks.[17] The Kachinas remain in the villages until July, after the Niman, or Going Home Ceremony, at which time they return to the San Francisco Peaks. Boughs are collected from the Peaks for use during Niman; water from springs is collected as well, usually from high up on the Peaks.[18]

The Peaks are one of the major landmarks that define the traditional and spiritual boundaries of *Hopitutsqwa*, "Hopi land" and the territory for which they act as stewards of the land through their pact with *Ma'saw*, the guardian of this, the fourth world.[19] The Peaks are mentioned, or figure prominently, in numerous folk tales and oral traditions of

[13] Titiev, 1944; Loftin, 1991
[14] Loftin, 1991
[15] Malotki, 1987:10
[16] Malotki, 1987:32,169
[17] Malotki, 1987:30
[18] Pilles, 2003
[19] Id.

the Hopi.[20] These traditions mention the Peaks as a reference point[21] or as the location where the stories took place.

Pilles[22] notes that trails lead from the Hopi Mesas to the San Francisco Peaks and are traditionally used as part of annual pilgrimages and collecting expeditions. During the winter solstice when the *Soyalang* ceremony is done, the Hopi reenact their emergence tradition. Pilgrimages are made to the Peaks to collect Douglas-fir, evergreen plants, and ice for the ceremony. "Prayers are said for prosperity, for good health, for our own families, our grandchildren, ourselves, and for the world over,"[23] Former Tribal Chairman Ferrell Secakuku describes the Peaks as a spiritual center of the Hopi. "We go there to make prayers to our ancestors and deities to protect us and to support our prayers when we do our ceremonies, so we could come in touch with the cloud people, who bring rain. Rain is a symbol of life. Rain represents nourishment."[24]

Navajo

The Navajo people believe that the Creator placed them on land between sacred mountains: Blanca Peak in Colorado, Mount Taylor in New Mexico, the San Francisco Peaks in Arizona, and Hesperus Peak in Colorado. According to their own history, the Navajos have always lived between these mountains. Each of the four mountains is associated with a cardinal direction, symbolizing the boundaries of the Navajo homeland. For the Navajo, the Peaks are the sacred mountain of the west, *Doko'oo'sliid*, "Shining on Top," a key boundary marker and a place where medicine men collect herbs for healing ceremonies. Navajo mythology tells that San Francisco Peak was adorned with *Diichilí*, Abalone Shell, Black Clouds, Male Rain, and all animals, besides being the home of *Haashch'éélt'i'í* (Talking God), *Naada'algaii 'Ashkii* (White Corn Boy), and *Naadá 'Altsoii 'At'ééd* (Yellow Corn Girl). The sacred name of the Peaks is *Diichilí Dzil* – (Abalone Shell Mountain). The Navajo people have been instructed by the Creator never to leave their sacred homeland.[25] *Dook'o'osliid* and the other three sacred mountains are the source of curing powers. They are seen as a single unit, such as the wall of a Hogan, or as a particular time of a single day. *Dook'o'osliid* is seen as a wall made of abalone shell and stone, with mixed yellow and white bands.[26]

The Peaks are recognized as a source of water. As one Navajo said "I go to the Inner Basin to place *nlt'iz* and prayers for rain." The Peaks contain numerous sacred places, such as springs, trails, cairns, offering places, plant gathering areas, and mineral gathering areas. In addition, rocks, plants, trees, coal, clay, water and soil are specifically

[20] Nequatewa, 1936; Parsons, 1967
[21] Mullett, 1979:76, 80; Nequatewa, 1936:86-93
[22] Pilles, 2003
[23] Reid, 2001
[24] Id.
[25] http://www.lapahie.com/San_Francisco_Peak.cfm; http://www.cpluhna.nau.edu/Places/san_francisco_peaks.htm
[26] Reid, 2001

collected from the Peaks.[27] Each of these is important for specific ceremonies as well as for food and other every-day purposes.[28] For example, pinyon nuts and firewood collecting are the main reasons Navajo go to the forests, other than to collect medicinal plants.[29] Earache medicine was prepared from the pulp of a tree (*tsidisi)* found on the San Francisco Peaks.[30] Animals living on the Peaks are also sacred, such as owls and other birds. Owls have a sacred and significant place in Navajo history and are responsible for specific ceremonial actions such as the *Tl'ee'ii* (the Nightway, or *Yeii-bi-cheii).*

Pilles[31] notes that some indication of the importance of the San Francisco Peaks to Navajo in their daily lives can be seen from study of Navajo uses of the National Forests of northern Arizona. In a specific study of these uses, 37 percent of their informants indicated that they gather medicine from sacred places, 23 percent said they pray to them, and 20 percent said the make offerings at these sacred places.[32] In other words, sacred places, pre-eminently the San Francisco Peaks, play an important role in the lives of at least 37 percent of the Navajo people living in northern Arizona.

Today there are ceremonies conducted on the Peaks by both the Hopi and Navajo people. For example, plants and herbs are gathered and shrines and ancestral dwellings visited. There are numerous medicinal herbs and other plants at several levels of the Peaks that are used in traditional ceremonies and to treat the ailments of Native American people. The Forest Service is unaware of any plants or other natural resource materials used by affiliated tribes within the Snowbowl SUP area. Both tribes (and others as needed) have access to their sacred sites, conduct ceremonies, and gather plants of traditional importance and herbs when needed. These activities are of central importance to the religious beliefs and practices of both Tribes.

Other Tribes

The Hopi and Navajo are most directly associated with the Peaks and their religious and spiritual connections to the Peaks have been relatively well documented. Therefore, only brief mention of a sample of the other tribes with spiritual connections to the Peaks is offered here. Additional information may be found in the draft National Register nomination prepared by Peter Pilles, Coconino National Forest Archeologist.

Apache

The Peaks are a very important and powerful place to many traditional Apaches in San Carlos and elsewhere.[33] Mountains are prayed to because clouds hang on them and

[27] Vannette and Fearey, 1981:47
[28] Cameron Chapter, 1992; Jensen *et al,* 1998
[29] Vannette and Fearey, 1981:44
[30] Franciscan Fathers, 1910:112, 202
[31] Pilles, 2003
[32] Vannette and Fearey, 1981:31
[33] Cassa, 1999.

Lightning People are on them. As with other tribes in their concepts of the relationship of mountains to water,

> *"When we go up the Mountain we pray as we go. We take every step with prayer. When our prayers are answered we see the water come. There are life-giving waters on the Mountain. The rain that comes sprinkles everyone even in the valley and it blesses everyone. Our prayers go through the Mountain, to and through the top of the Mountain"*[34]

They are prayed to for crops, life, and hunting.[35] Mountains are also considered to be the home of the ga'an (mountain spirits) and the San Francisco Peaks have been identified as one of the places of the ga'an.[36] Because of this, people did not go far up the San Francisco Peaks, as supernatural beings lived on the top.[37] Their association with mountains is also reflected by their dress. They usually have spruce boughs tied to them as well as eagle and turkey feathers - birds that are often associated with the mountains.[38]

Acoma

The San Francisco Peaks are the western boundary marker for the Acoma, and are considered to be their Guardian of the West. The Acomas' protection shrine is on top of the Peaks. They perform ceremonies on the Peaks and collect soil, water, and plants from it for ceremonial and medicinal purposes.

Yavapai

The San Francisco Peaks are recognized as the northeastern boundary of Yavapai territory[39] and contain "a lot of sacred things."[40] The area around the Peaks was used to collect pinyon nuts and grass seeds as well as for hunting, collecting wild plants for food, and other plants for medicines.[41] Songs are sung about the Peaks and relate to various specific places and areas.

Havasupai

The Havasupai perceive the world as flat, marked in the center by the San Francisco Peaks, which were visible from all parts of the Havasupai territory except inside the Grand Canyon. The commanding presence of the Peaks probably accounts for the Peaks

[34] Stanley, 1992: in Spoerl, 2001
[35] Goodwin, 1929-1939:89
[36] Goodwin, 1929-1939:85
[37] Goodwin, 1969:44
[38] Goodwin, 1929-1939:88
[39] Khera and Mariella, 1983:39
[40] Marquez, 1998
[41] Schroeder, 1959

being central to the Havasupai beliefs and traditions, even though the Peaks themselves are on the edge of their territory.[42]

Zuni

The San Francisco Peaks are an ancestral site in the Zuni migration narrative. Willow, aspen, and medicinal herbs are collected from the Peaks, as well as soil.

SUMMARY OF CULTURAL RESOURCE INVESTIGATIONS WITHIN THE SUP AREA

CNF Archeology records indicate that at least 14 cultural resources surveys have been conducted within the Snowbowl SUP area since 1980.[43] These surveys provided cultural resource clearance recommendations for the development of the Snowbowl to its current state under the auspices of the Record of Decision (ROD) that approved the 1979 Final Environmental Statement for the Arizona Snowbowl Ski Area Proposal.[44]

Prior to 1979, Snowbowl had operated the Agassiz Chairlift with two primary trails. Following the 1979 ROD, Snowbowl made plans for the Hart Prairie Chairlift. A cultural resources survey of that lift was conducted by the Northern Arizona University (NAU) Department of Anthropology,[45] recorded one cultural property outside the proposed alignment - the site of the original Snowbowl Lodge, which was constructed in 1941 and subsequently burned to the ground in 1952. The Hart Prairie Chairlift alignment was later modified so that the new alignment – as well as the site of a proposed Hart Prairie Lodge, the Sunset and Aspen chairlifts and their associated ski trails, and new trails serviced by the Agassiz Chairlift – was included in the areas surveyed by NAU.[46] At the same time, CNF archeologists conducted the survey of the existing ski trails.[47] No additional cultural resources were identified. In a letter from Ann A. Pritzlaff, Arizona State Historic Preservation Officer, to Neil R. Paulson, CNF Forest Supervisor, dated September 11, 1981, the site of the original Snowbowl Lodge[48] was said to be ineligible for listing on the NRHP and clearance for the first stage of development was granted by the CNF. In 1983, NAU surveyed a small block area between the Snowbowl Road and the Snowbowl maintenance shop road, a power line extending to the south from the maintenance shop, and a right-hand turning lane off of U.S. Highway 180 at the other end of Snowbowl Road.[49] No cultural resources were identified.

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[42] Id.

[43] Bremer 1987, 1989; Bremer and Holden, 1986; Clements 1981; Dosh, 1997, 1999, 2002; Farnsworth, 1986, 1993; Geib, 1983; Harper, 1995a, 1995b; Kelley, 1980; Pilles, 1988; Stein and Pilles, 1981

[44] USDA Forest Service, 1979

[45] Kelley, 1980

[46] Clements, 1981

[47] Stein and Pilles, 1981

[48] AR-03-04-03-199

[49] Geib, 1983

From 1986 to 1995, CNF archeologists conducted all surveys within the Snowbowl SUP area. Farnsworth surveyed for replacement of the Agassiz Chairlift, the construction of the Aspen Chairlift (a survey previously covered)[50], minor trail improvements within *Lower Bowl* (trail #29), *Logjam* (trail #25), and along *Ridge Run* (trail #26), and the road shoulders between Hart Prairie Lodge and Agassiz Lodge.[51] That same year, Bremer reported on a survey of *Pomal*,[52] and the following year, on a survey of proposed telephone and power corridors between Hart Prairie Lodge and the maintenance shop (another survey previously covered by Clements[53] and Geib[54]). In 1988, Pilles provided the documentation, assessment, and recommendations for converting an existing restroom into a locker room.[55] The existing structure was determined ineligible for listing onto the NRHP because it was less than 50 years old. The following year, in a letter from Bremer to Tom Holden (CNF) dated May 15, 1989, clearance documentation was provided for additional parking areas (another previously covered survey by Clements)[39] and minor trail improvements at the top of the Sunset Chairlift, along the Agassiz Chairlift, and within *Lower Bowl* (trail #29) and through *Logjam* (trail #25). In 1993, Farnsworth reported on a survey of significant trail widening from *Lower Bowl* (trail #29) through *Logjam* (trail #25) and *Wild Turkey* (trail # 20), and smaller improvements between *Ridgeway* (trail #22) and *Blackjack* (trail #17).[56] More recently, the two-track road from the maintenance shop to the top of the Sunset Chairlift, the top of the Hart Prairie Chairlift, and an area around Agassiz Lodge was surveyed;[57] soon thereafter followed by a survey of an existing parking area west of the Hart Prairie Lodge (another survey previously covered by Clements),[58] the newly proposed ski trail between *Casino* (trail # 23) and *Logjam* (trail #25), and large block areas between the Hart Prairie Chairlift and *Ridge Run* (trail #26).[59] Harper recorded one historic "dendroglyph" (carved bark of an aspen tree) northeast of Agassiz Lodge, which was inscribed "DANIAL GALAR - Julio 29 1928." It was recorded as an "Isolated Find" and treated as ineligible for listing onto the NRHP.

In 1997 and 1998, additional survey work was assigned to Northland Research. The first for these surveys included a cellular tower location within the maintenance area, where no cultural resources were recorded. The remaining surveys filled gaps between areas covered by prior surveys, totaling approximately 120 acres and including approximately 15 acres of previously surveyed coverage. In addition, another 95 acres were surveyed within the lower end of the SUP area to complete the survey of the entire SUP area, except for approximately 70 acres of steep, high-altitude areas within the permit area

[50] Clements, 1981
[51] Farnsworth, 1986
[52] Bremer, 1986
[53] Bremer 1987, 1989; Bremer and Holden, 1986; Clements 1981; Dosh, 1997, 1999, 2002; Farnsworth, 1986, 1993; Geib, 1983; Harper, 1995a, 1995b; Kelley, 1980; Pilles, 1988; Stein and Pilles, 1981
[54] Geib, 1983
[55] Pilles, 1988
[56] Farnsworth, 1993
[57] Harper, 1995a
[58] Clements, 1981
[59] Harper, 1995b

where cultural resources have been deemed unlikely to occur. The plan to exclude those 70 acres was accepted by CNF, and the final clearance report for the entire SUP area was completed in 1999.[60] Through all of these surveys, no significant or eligible cultural resources were recorded within the Snowbowl SUP area.

SURVEY OF PROPOSED RECLAIMED WATER PIPELINE ROUTE

A Class III (intensive) cultural resources inventory survey was conducted within the proposed reclaimed water pipeline route between the City of Flagstaff and the Snowbowl. The Class III survey included all land that had not been previously included in prior surveys. A Class I records search was conducted for all other areas of the proposed route. The proposed route traverses both public and private lands, including the CNF, Arizona State Trust land, City of Flagstaff land, and land owned by Lowell Observatory (refer to Figure 2-4). Much of the route is consistent with and lies within the existing rights-of-way of Snowbowl Road and the Transwestern Pipeline Company, Flagstaff Lateral Pipeline. The total length of the proposed pipeline route is 78,012 linear feet. A total of 65,920 feet had been previously surveyed, leaving just 12,092 feet the subject of the Class III survey reported here. The existing Flagstaff Lateral Pipeline right-of-way, which the reclaimed water pipeline follows, is 50 feet in width, so a corresponding 50-foot width was surveyed for the proposed reclaimed water pipeline right-of-way as well.

With the exception of the route through Lowell Observatory, a short segment through Arizona State Trust land located in the adjacent Section 18, Township 21 North, Range 7 East, and a paved section along West Birch Avenue in Flagstaff, all of the proposed pipeline route had been included in three prior cultural resources inventory surveys.[61] Previously unsurveyed portions of the route, totaling 12,092 linear feet of the right-of-way, were surveyed for this analysis resulting in a complete survey of the entire proposed pipeline route.

ENVIRONMENTAL CONSEQUENCES

DIRECT AND INDIRECT EFFECTS

In some cases, indicators were combined throughout the Direct and Indirect Effects section in order to avoid redundancy.

Snowmaking

Issue:

The installation and operation of snowmaking infrastructure as described in the Proposed Action, and the use of reclaimed wastewater as a water source, will impact cultural and spiritual values associated with San Francisco Peaks.

[60] Dosh, 1999

[61] Dongoske, 2003; Purcell, 1992; Stein and Pilles, 1981

Indicator:

Qualitative Discussion of the Spiritual Values of the San Francisco Peaks and the Potential for Incremental Change As a Result of Implementation of the Proposed Action

Alternative 1 – No Action

Under the No Action Alternative no new construction or modification, including snowmaking infrastructure, would occur within the SUP area. The impacts of selecting Alternative 1 on the sacred values of the Peaks are discussed under the next issue heading. Current conditions that allow for the gathering of plants and other forest products, visitation to sacred shrines and sites, would continue. The spiritual values of the Peaks that are delineated in the cultural background section would continue as they are today. The presence of the ski area on the Peaks would continue in its existing configuration.

Alternative 2 – The Proposed Action

The Hopi believe that the Peaks generate their own weather conditions, forming cumulus clouds that provide the life-giving rain to sustain crops, animals, and human life. The rain also recharges groundwater supplies that result in a number of springs across the Peaks.[62] The Hopi believe that the addition of snowmaking would adversely impact the natural process of precipitation.

The 1975 Hopi Tribal Resolution[63] noted that there are numerous medicinal herbs and other plants at several levels of the Peaks that are used to treat the ailments of the Hopi people. The Forest Service is unaware of any plants or other natural resource material used by the Hopi within the Snowbowl SUP area; however, the addition of new trails, increased parking, and the potential for additional annual visitation within the SUP area and the San Francisco Peaks themselves causes concern among the Hopi and other tribes that their areas of traditional use would be impacted. Specifically, the Hopi make pilgrimages to shrines and use the Peaks for religious reasons such as gathering evergreens and herbs and delivering prayer feathers.

Although the reclaimed water proposed for use in snowmaking fully meets both the EPA and ADEQ water quality standards, it is believed that trace levels of unregulated residual constituents within reclaimed water (e.g., pathogens, pharmaceuticals, hormones, etc.) could negatively impact the spiritual and medicinal purity of resident flora on the Peaks. Several specific concerns have been raised about the impact of snowmaking on the spiritual values of the Peaks.

The Hopi have expressed concern that plants that are used in ceremonies would be affected spiritually in two ways: 1) the increased water would impact the natural growth

[62] Pilles, 2003, section 9:1

[63] The 1975 Hopi Tribal Resolution is explained in more detail below.

of plants, and 2) runoff from the Peaks to areas where they collect plants would not be pure, natural rainwater - thus affecting its spiritual content. The Hopis' traditional/medicinal uses of plants and water would therefore be directly affected. Tribes contend that additional snowmelt and runoff would impact plants and wildlife in the surrounding area by affecting the natural growth processes of medicinal/ceremonial plants which are necessary for the plants' effectiveness in ceremonies. An additional concern is that some of the reclaimed water once passed through hospitals or mortuaries could carry the spirits of the dead with it. Those spirits, as part of the water draining from the Peaks, would then infiltrate the plants, thus affecting the plants and their purpose in ritual.

From both a Hopi and Navajo perspective, the plants within and down slope of the Snowbowl SUP area that would be affected by reclaimed water may no longer be viable for use in sacred ceremonies or for medicinal purposes, thus affecting Hopi and Navajo ability to perform ceremonies properly and keep their religion alive. For the Navajo, they believe that the plants, rocks, life, and spirit of the Peaks need to be respected, and that the application of reclaimed water – which is believed to be "unclean" – on the land would desecrate the spirituality of the Peaks. Both groups strongly believe that wastewater cannot be purified in a way that does not impact the cultural and spiritual value of the Peaks, and that the use of reclaimed water on the Peaks would adversely affect the spirits that reside their. These concerns are focused on spiritual and cultural issues, not the actual biological purity of the water itself (i.e., the fact that reclaimed water meets both EPA and ADEQ standards is irrelevant to tribal peoples).

The Hopi believe that the spirits are responsible for moisture and that the installation of snowmaking technology within the SUP area would alter the natural processes of the San Francisco Peaks and the responsibilities of the spirits who are believed to reside there. As stated at an August 21, 2002 meeting with the Hopi, "if Snowbowl makes their own snow, the spirits will say: "they can make their own moisture, they don't need us" and they will leave. Snowmaking would desecrate our beliefs. Let the spirits make the moisture." In addition, spruce and Douglas-fir, both of which are found on the higher slopes of San Francisco Peaks, are connected to the clans. Douglas-fir is perceived to be a house of *katsinas* and a strong attractor of rain. The addition of snowmaking would add "false moisture" to these trees and thus affect their ability to offer rain to the Hopi as well as impact their religious ceremonies.

Finally, the Hopi and Navajo need to have access to sacred areas. With an increased snowpack due to snowmaking within the SUP area, a concern was expressed that access would be more restricted to shrines and sacred places, and that plants would be adversely affected by the increased snow and moisture that would be present at times when the Peaks should be dry. Currently, the Snowbowl provides summer access to Tribal members allowing them to ride the Agassiz Chairlift to the ridgeline making it easier for them to access the high elevation areas, beyond the Snowbowl SUP area, for religious purposes. Other than utilizing the Agassiz Chairlift, it is not known if Tribal members access the Peaks by way of the SUP area or along the Humphreys Trail into the Wilderness. If access for religious purposes does occur through the SUP area, it is likely

during the late spring or summer months when snowpack is not an issue. If access were desired over-the-snow, the snowpack on the lower reaches of the ski area if augmented with snowmaking would have a negligible persistence as compared with a natural snowpack.

Thus, from an ethnographic landscape perspective, the use of reclaimed water and resulting increased moisture (thereby taking away the responsibilities of the spirits that reside on the Peaks) associated with snowmaking within the SUP area may further impact the spiritual character of the entire Peaks beyond historic and existing ground disturbance. This could impact their ability to properly complete rituals.

Under the Proposed Action the Forest Service would work with the Tribes to ensure continued and adequate access to sacred areas and accessibility for the collection of plants needed for ceremonies and medicinal purposes. Monitoring of areas important to the Tribes would be conducted to protect them from other impacts such as public visitation or construction. The focus will be on providing the Tribes the opportunity to have their religious experience in an uninterrupted manner.

Alternative 3

Under Alternative 3 no snowmaking would occur within the SUP area. Without snowmaking, Alternative 3 addresses the concerns expressed by the Tribes about the integrity of the natural/sacred landscape and plants as a result of the addition of reclaimed water and machine-produced snow.

Scarring of the Sacred Mountain

Issue:

Proposed ground disturbances and vegetation removal may result in permanently evident, visible alterations (i.e., "scarring") of the San Francisco Peak's landscape.

Indicators:

Narrative Description of Existing and Historic Vegetation and Ground Disturbance Within the SUP Area

Quantification of Existing and Additional Proposed Temporarily and Permanently Evident Vegetation Disturbances/Removals

Quantification of Existing and Additional Proposed Temporary and Permanently Evident Ground Disturbances

Qualitative Discussion of the Cultural Significance of Proposed Ground and Vegetative Disturbances and Removal Within the SUP Area

Alternative 1 – No Action

Since approximately 1938, development of the Snowbowl has evolved with chairlifts, lodges, paved roads, parking lots and ski and hiking trails. Since that time, approximately 100 acres of overstory vegetation have been cleared throughout the Snowbowl's SUP area, along with additional ground disturbance, for terrain and related infrastructure.

While numerous changes to lands within the boundary of the Snowbowl SUP area have occurred, comments made to Forest Service personnel over the years indicate that the Peaks in fact retain an integrity of condition related to the traditional religious, cultural, natural, and social values that make the Peaks significant to the Tribal people of the region.[64] However, from an ethnographic landscape perspective (as defined by the National Park Service – see Existing Conditions) historic ground and vegetation disturbance within the SUP area may have visually impacted the entirety of the Peaks, even if the disturbance did not occur in specific areas of ethnographic usage. Therefore, selection of Alternative 1 may represent a continued impact on the Peaks' spiritual character and the ability of rituals to be properly completed.

It should be noted that the tribes have objected to the Snowbowl's presence from the beginning, due to the belief that any disturbance of the Peaks is sacrilegious and therefore the continued use of the Peaks for a developed ski area negatively impacts its sacred values. Comments made at a Hopi public meeting indicate a belief that recent years of drought have been caused by the "misuse" of the Peaks by the Snowbowl's existence and continued operations; nonetheless, there is also an enduring belief that the Peaks retain their spiritual values.

In 1975, through a Tribal Resolution, the Hopi Tribal Council objected to the development of the Snowbowl. Their objection[65] was based on a basic precept of the Hopi religion that the land is sacred, and the San Francisco Peaks are a most sacred part of the land. The Hopi, in 1975, explained that the land was sacred because of the existence of shrines around and within the Peaks, that their religious ceremonies are regulated by the sacred Peaks and the calendar associated with them, that Hopi medicine men gather medicinal herbs and other plants at several levels on the Peaks, and that the Peaks are the traditional home of the Hopi *katsinas*. In 1984 The Hopi Tribal Council passed another resolution[66], which noted concerns about the development of trails by the CNF on parts of the San Francisco Peaks within the federally designated Wilderness area; their objection was based on the same issues as in the 1974 resolution - that the Peaks are sacred. Both Hopi and Navajo oral histories emphasize the importance of the Peaks to their cultural integrity and religion. Disruption of the natural presence of the Peaks is a

[64] Pilles, 2003

[65] Hopi Tribal Resolution H-31-75.

[66] Hopi Tribal Resolution H-125-84.

disruption of their guiding spirits, and as the natural quality of the Peaks is modified and disturbed, it is believed that the spiritual life of their people will perish.[67]

While the No Action Alternative would not change the current configuration of the Snowbowl and would cause no additional ground or vegetation disturbance to the area, the Hopi Tribal Council and other tribes remain in opposition to the Snowbowl's continued presence on the sacred San Francisco Peaks landscape because of the negative impact on the religious practices of their people.

Alternative 2 – The Proposed Action

Ground disturbance associated with the Proposed Action is provided in Table 3A-1.

Table 3A-1
Proposed Action Ground and Vegetation Disturbance

Type of Disturbance	Amount of Disturbance (acres)
Overstory Vegetation Removal	76.3
Permanent Ground Disturbance	10.4
Temporary Ground Disturbance	235.7[a]

[a] Approximately 64 acres of temporary ground disturbance are associated with construction of the water pipeline between Flagstaff and the Snowbowl.

Alternative 2 includes snowmaking infrastructure, construction of a 10 million gallon water impoundment, a reclaimed water pipeline extending from the City of Flagstaff to the ski area, a snowplay facility, additions to the lift and trail networks, additional parking lots and other infrastructural additions. The permanent nature of these projects would be significant to the cultural landscape of the Peaks.

The reader is specifically referred to the Aesthetic Resources section (Section D), within this chapter, for a detailed description and quantification of the anticipated temporarily and permanently evident ground disturbances and vegetation removal associated with the Proposed Action.

If one regards the Peaks as a living entity, as believed by the Native American tribes that consider it sacred, any additional ground disturbances and vegetation removal would be considered as harming them. Not only would the Peaks be scarred, but also there would be additional noise and activity, which would impact their ability to rest and be strong for religious ceremonies. An example of the Hopi perspective on additional development within the SUP area can be gained from the December 2002 public meeting, in which Raleigh Pooyouma noted that these are the only sacred peaks the Hopis have. He noted that every month they go there for prayers. In July they go to collect greens and herbs for the home and bean dances. He stated, "Development is like cutting the heart and blood vessels of a living being."

[67] Carothers and House, 1985

From an ethnographic landscape perspective, additional ground and vegetation disturbance within the SUP area associated with the Proposed Action could further impact the visual quality, as well as spiritual integrity, of the Peaks beyond the existing conditions (Alternative 1). This could impact the ability to properly complete rituals.

Although there is no evidence for the presence of any plants of traditional importance within the Snowbowl SUP area, the removal of 76 acres of vegetation would affect the integrity of the Peaks and therefore impact its sacred values. Ground disturbance within the SUP area, especially the 10 acres of permanent ground disturbance, would impact the sacred values of the Peaks and their spiritual nature. The sacred qualities are manifested by the undisturbed appearance of the Peaks as a landmark upon the horizon, as viewed from the traditional or ancestral lands of the Hopi, Zuni, Acoma, Navajo, Apache, Yavapai, Walapai, Havasupai, and Paiute[68]. As an additional example that goes beyond the purely religious, we can consider the role of the *katsinas* when they depart the San Francisco Peaks after the conclusion of the winter solstice and return after the summer solstice. During their time at Hopi the *katsinas* are involved in dances related to fertility, growth, harvest, rain, and other needs. Prior to their return to the Peaks they dance, especially for rain and crop growth. In addition to religion, the *katsinas* and associated ceremonies can be seen then as closely related to agricultural concerns and needs. The disturbance of their home could have a direct impact on the *katsinas*, and, as a result, on the Hopi and their ability to have a successful harvest.

There is no way to quantify the amount and types of plants that are gathered by the Hopi and others for their ceremonies and medicinal use, especially within the SUP area. This information is private and only available to those who practice the religion. It is known, however, that pilgrimages do occur at specific times of the year for the purpose of visiting shrines and gathering certain plant materials such as Douglas-fir and evergreen plants. At this time, as far as the Forest Service knows, the plants that are gathered exist outside the immediate Snowbowl SUP area. The Forest Service is unaware of any plants or other materials that are gathered or used from within the SUP area.

Should the Proposed Action be selected, the Forest Service would work with those tribes actively using the area to identify any culturally significant plants with potential for disturbance and relocate them in new areas on the Peaks. The Forest Service could also require the reintroduction of any plants that would be impacted. The Forest Service would continue to work with the Tribes to promote and protect plants that are sacred and traditionally located outside of the permit area. Such a "habitat exchange" is one way to mitigate physical impacts to the Peaks. In addition, feathering of the forest canopy to minimize the visual impact of any new trails would help mitigate tribal concerns. Neither of these methods would completely mitigate the spiritual impact to the Peaks or to the ethnographic landscape, but could help alleviate direct impacts to vegetation.

[68] Pilles, 2003, section 8:1

Survey of Proposed Reclaimed Water Pipeline Route

All sections of the proposed reclaimed waterline route corridor, except those portions through Lowell Observatory, the State land in Section 18, and West Birch Avenue were previously surveyed and no archaeological resources were found during those surveys. For planning purposes, a survey of the remaining locations of the proposed water pipeline corridor was conducted in 2003 to ascertain whether or not there are any archaeological resources present and to provide information for the Snowbowl EIS and the development of alternatives. There are no archaeological resources present that cannot be avoided or mitigated, except for that portion located within the Peaks TCP. Further, the proposed waterline right-of-way would not adversely affect any significant contributing elements within the *Lowell Observatory National Historic Landmark* or *Flagstaff Townsite Historic Residential District*. Clearance for the entire Snowbowl undertaking will be dealt with as a whole in a Memorandum of Agreement.[69]

Alternative 3

Table 3A-2
Alternative 3 Ground and Vegetation Disturbance

Type of Disturbance	Amount of Disturbance
Overstory Vegetation Removal	64.4 acres
Permanent Ground Disturbance	1.7 acres
Temporary Ground Disturbance	130.3 acres

Alternative 3 also reduces ground and associated vegetation disturbance with elimination of the snowplay facility and parking lot. As compared to the Proposed Action, Alternative 3 reduces ground disturbance by approximately 114 acres[70] and vegetation removal by approximately 12 acres.

While Alternative 3 includes a reduced amount of ground and vegetation disturbance than the Proposed Action, the overall impact to the sacred nature of the Peaks is estimated to remain tangibly the same. The issue of disturbance to the Peaks is essentially not one of how much land is disturbed, but that the land is disturbed at all. From the perspective of the Tribes, any additional disturbance to the landscape is adverse and would harm the spiritual nature of the Peaks, the Tribes' ability to conduct their ceremonies, and the ability of the spirits to respond to prayers. As with the Proposed Action, from an ethnographic landscape perspective, ground and vegetation disturbances within the SUP area could further impact the visual quality of the Peaks. In addition to the Snowbowl's existing facilites and trails, Alternative 3 may further impact the spiritual character of the Peaks and the ability for rituals to be properly completed.

[69] Cultural resources clearance for the reclaimed water pipeline corridor is dependant upon review of the report by the Arizona SHPO.

[70] Approximately 64 acres of this reduction in ground disturbance are associated with off-site construction of the reclaimed water pipeline between the Snowbowl and Flagstaff.

The Navajo consider the Peaks to be a living entity, the home of "the Mountain People," - the wildlife, the plant people, people of the rocks, people of the underbrush, people of the water, and people of the sky, as well as being the source of rain.[71] To alter the landscape then would harm this living being. The amount of harm is not an issue; any harm to the Peaks will affect all the living things that reside there.

The major issue with Alternative 3 concerns the visual impacts from the ground disturbance, and therefore the very acts of vegetation removal and ground disturbance. While no plants of traditional importance or other materials that are gathered appear to be used from within the Snowbowl SUP area, the concern is the action of the disturbance. Should Alternative 3 be selected, the Forest Service would work with the tribes to help mitigate their concerns by minimizing the visual impact of approved projects through feathering and prompt revegetation. While these actions would not completely mitigate the spiritual impacts to the Peaks or the ethnographic landscape, they could help alleviate direct impacts to vegetation.

National Register Nomination

Issue:

Some people feel the effects of the Proposed Action cannot be adequately described until the significant qualities of the San Francisco Peaks are identified as part of the National Register nomination process.

Indicators:

Narrative Discussion Why the Proposed Action is Not Dependent Upon Completion of the National Register Nomination/Designation Processes

Narrative Discussion of the Ability for the Proposed Projects to Coexist With a National Register Designation If Nomination Is Approved

Alternative 1 – No Action

The San Francisco Peaks is a TCP as defined in National Register Bulletin 38: *Guidelines for Evaluating and Documenting Traditional Cultural Properties.* The Peaks have also been determined eligible for inclusion in the National Register of Historic Places as part of the White Vulcan Mine Settlement Agreement and Mine Closure in August 2000. As a result of its determination of eligibility, the Forest Service is required to consult with Tribes and interested parties regarding the effect of the Proposed Action upon the Peaks, regardless of whether the Proposed Action occurs.[72] The Forest Service is in the process of completing a National Register nomination for the Peaks as a TCP. The area to be designated as a TCP would be inclusive of the Arizona Snowbowl SUP and would encompass 74,380.5 acres of NFS lands.

[71] Pilles, 2003, section 8:1

[72] 36 CFR Part 800, Protection of Historic Properties.

Alternative 2 – The Proposed Action

The Proposed Action would have no impact on the National Register eligibility of the San Francisco Peaks as a TCP. Completion of a National Register nomination is underway by the Forest Service and will occur regardless of whether the Proposed Action is approved. The Arizona State Historic Preservation Office, San Carlos Apache, Yavapai-Apache, Hualapai, and Yavapai-Prescott Tribes have reviewed drafts of the nomination. The Hopi are in the process of reviewing and commenting on the draft nomination. Because the Snowbowl SUP area accounts for only one percent of the San Francisco Peaks,[73] it is assumed that the cultural values that pertain to the Peaks would be retained, even if the religious values were partially diminished as a result of the Proposed Action.

Alternative 3

The impacts of selection of Alternative 3 on the National Register eligibility of the San Francisco Peaks as a TCP are assumed to be identical to those of the Proposed Action - the cultural values that pertain to the Peaks would be retained, even if the religious values were partially diminished.

CUMULATIVE EFFECTS

Scope of Analysis

Spatial Bounds

In considering the cumulative actions that have in the past, and could potentially have in the future, an effect on cultural resources, the entirety of the San Francisco Peaks were considered within the TCP boundary. As a result, past, present and reasonably foreseeable future actions both within and beyond the Snowbowl SUP Area were considered in this cumulative effects analysis.

Temporal Bounds

The Peaks have maintained a cultural and religious role in the lives of indigenous peoples in the Four Corners area considerably pre-dating establishment of the Snowbowl in 1938. However; for the purposes of this cumulative effects analysis, it is assumed that effects to the Peaks began in 1938, with development of the original Snowbowl facilities and will continue into the foreseeable future.

Past, Present and Reasonably Foreseeable Future Actions

A review of past, present, and reasonably foreseeable future actions is important when considering effects to the religious and spiritual values of the Peaks. Past actions include

[73] Calculation based on the 74,380-acre area included in the TCP nomination and the existing 777-acre SUP area.

a number of activities which have occurred on, and in the vicinity of, the San Francisco Peaks, both within and beyond the Snowbowl SUP area. Appendix C includes the full list of past, present and reasonably foreseeable future actions analyzed in this document, as well as background information on each of them.

Within SUP Area

1. Development of ski area infrastructure over the past six decades, including: aerial and surface lifts, approximately 139 acres of developed trails, two guest lodges, paved and dirt roads, and parking facilities
2. Year-round visitation and activities including skiing, the summer Sky Ride program, weddings, and occasional concerts.
3. Snowbowl Wireless Communications Site (approved but yet to be constructed)

Outside of SUP Area

1. Inner Basin Well Field
2. Inner Basin Water Pipeline Development and Maintenance
3. Adjacent private land development
4. Veit Springs Land Exchange
5. Kachina Peaks Wilderness designation
6. Snowbowl Road parking restrictions
7. San Francisco Mountain Mineral Withdrawal
8. White Vulcan Mine Settlement and Reclamation
9. Peaks Segment of the Arizona Trail
10. Miscellaneous/ongoing recreational uses
11. Bebbs Willow Restoration Project
12. Peaks Nomination to National Register
13. Fort Valley Restoration Project

Prior to their approval, the Forest Service assessed the potential cultural effects of implementing these individual projects (in all cases involving Forest Service jurisdiction). Considered individually, none of these projects has been regarded as posing significant, adverse effects on the spiritual values of the Peaks. However, when considered cumulatively, these individual projects may have already affected the spiritual values of the Peaks.

Alternative 1 – No Action

From an ethnographic landscape perspective, over time, the previously-noted historic ground and vegetation disturbances have individually and cumulatively effected, or "scarred," the Peaks. Visual impacts on sacred shrines or trails used for religious purposes may affect the ability of the tribes to conduct their ceremonies. As indicated, when considered individually, none of these projects has been determined to have caused significant, adverse indirect effects to the Peaks. However, when considered cumulatively, they may have significantly affected the Peaks' spiritual character and the ability of rituals to be properly completed.

While the tribes have indicated concern and dissatisfaction with the existing conditions of the Peaks (due to historic projects and activities), they have not indicated that past actions and the continued existence of permitted activities within the Snowbowl SUP area would have any additional effects on their abilities to continue conducting their religious ceremonies. Some statements, including one made on December 9, 2002 by Bucky Preston at the Kykotsmovi public meeting, indicate concern with the existing conditions: *"that the drought may be a result of the developments and activities that have occurred on the Peaks. This is the way the spirits tell the people that something is wrong; by not providing much needed moisture."* In 1981, former Hopi Tribal Chairman Abbott Sekaquaptewa stated,

> *"…Hopis believe that continued or expanded commercial use of the home of the Kachinas (the Peaks) for a ski area or any other similar commercial or recreational purpose, would constitute a direct affront to the Kachinas and to the Creator, thereby resulting in severe adverse consequences to the Hopis and all mankind…."*

While these statements indicate concern over the ability to conduct their religious practices, under the No Action Alternative, these practices continue today.

Past, present and reasonably foreseeable projects that could have a negative effect on the spiritual integrity of the Peaks due to "scarring" and increased human/infrastructural presence include: construction of the Inner Basin Well and Pipeline; increased recreational use of the mountain; the construction and operation of the White Vulcan Mine; construction of various utility corridors; adjacent private land development; and special uses such as weddings and family reunions in the area.

However; positive effects have been identified as well. Closing of the Snowbowl Road to winter parking and thereby dispersed Snowplay activities has been shown to be a positive effect to the San Francisco Peaks as Native Americans are given access to areas along the road and are now able to conduct ceremonies in a more uninterrupted/private manner. Forest restoration projects have also had a positive effect on the Peaks. Aspen exclosures, wildlife closure areas, road closures, Hart Hill restoration, the Kachina Peaks Wilderness designation, Fort Valley Ecosystem restoration, White Vulcan Mine Settlement and Restoration, and trails that concentrate previously dispersed use have all had positive effects on the Peaks because they are helping to restore the area to a more natural state through ecosystem restoration and limiting dispersed, public use. Determining the Peaks eligible for the National Register of Historic Places has offered the Peaks additional protection in that any undertaking on the Peaks now requires tribal consultation and a Cultural Resource Clearance Report.

Alternative 2 – The Proposed Action

In a cumulative context, both Alternatives 2 and 3 would result in adverse, long-term effects to the spiritual values of the Peaks. While the Proposed Action would ultimately

have a greater cumulative effect, due to the introduction of snowmaking and reclaimed water, under either action alternative the expansion of the facilities would further affect the current physical/spiritual condition of the Peaks when assessed with other past, present and reasonable foreseeable future projects.

According to Daniel Peaches, member of the Navajo Medicine Man's Association,

> *"Once the tranquility and serenity of the Mountain is disturbed, the harmony that allows for life to exist is disrupted. The weather will misbehave, the ground will shift and tremble, the land will no longer be hospitable to life. The natural pattern of life will become erratic and the behaviors of animals and people will become unpredictable. Violence will become the norm and agitation will rule so peace and peacefulness will no longer be possible. The plants will not produce berries and droughts will be so severe as to threaten all existence."*[74]

Native American inhabitants of the area believe not that they own the land, but that they are only custodians responsible for passing the resource on to the next generation – unimpaired. Both Hopi and Navajo legends emphasize the importance of the Peaks to the cultural integrity of their people. Disruption of the natural presence of the Peaks is a disturbance to the guiding spirits of these patient peoples and as the natural quality of the Peaks succumbs to the manipulations of man, it is believed that the spiritual life of the Native Americans also will perish.[75]

Many Tribal members believe the ground and vegetation disturbance that would occur as a result of implementation of the Proposed Action, in addition to past ground-disturbing activities, could lead to the following cumulative impacts to the San Francisco Peaks:

- Further disturb the home of the Kachinas and, as a result of this disturbance, the ability of Hopi people to have a successful harvest.
- Further impact the visual quality of the San Francisco Peaks.
- Additional scarring of the Peaks further affects the ability of spirits to respond to prayers and of tribes to conduct effective ceremonies.
- With better facilities, the ski area would receive increased annual visitation. As a result, there may be more opportunity for conflicts with traditional use of the mountain and an overall disturbance of the Peaks' tranquility and serenity.

Therefore, beyond the previously-identified direct/indirect impacts of machine-produced snow and reclaimed water use on the spiritual integrity of the Peaks, from a Tribal perspective, additional vegetation and soil disturbance related to construction of additional developed trails, roads, parking lots, buildings and snowmaking infrastructure

[74] Peaches, 1998

[75] Pilles, 2003

would further affect the landscape of the San Francisco Peaks, potentially causing additional physical harm through scarring. In addition, implementation of Alternative 2 would increase total annual visitation to the Peaks, thereby disturbing its tranquility and serenity. As noted, from an ethnographic landscape perspective, additional ground and vegetation disturbance, use of reclaimed water and the increased moisture that would result from machine-produced snow within the SUP area combined with other past, present and reasonably foreseeable future projects could further cumulatively impact the visual quality, and spiritual integrity, of the entirety of the Peaks.

The positive effects would be just as they are for the No Action Alternative. Additionally, more opportunity for monitoring special places may result. The development of a Cultural Center within the SUP area could offer Native Americans the opportunity to educate the general public about the sacred nature of the Peaks. Increased public awareness, when considered cumulatively with other previously-identified positive impacts may then help preserve special places on the Peaks.

Alternative 3

As with the Proposed Action, when considered with other past, present and reasonably foreseeable future actions, implementation of Alternative 3 would result in adverse, long-term cumulative effects to the spiritual values of the Peaks due to increased ground and vegetation disturbance. There is the belief among Tribal members that the ground and vegetation disturbance associated with Alternative 3 could: further disturb the home of the Kachinas and, as a result of this disturbance, the ability of Hopi people to have a successful harvest; further impact the visual quality of the San Francisco Peaks; further impact the ability of spirits to respond to prayers; and further increase annual visitation to the Peaks. As a result, there may be more opportunity for conflicts with religious use of the Peaks and impacts to special places, cumulatively disturbing of the Peaks' tranquility and serenity. Likewise, from an ethnographic landscape perspective, ground and vegetation disturbance within the SUP area associated with Alternative 3 could further and cumulatively affect the visual quality, and spiritual integrity, of the entirety of the Peaks.

Ground and vegetative disturbance that would occur as a result of implementation of Alternative 3 are essentially the same as under the Proposed Action, minus that associated with the snowmaking system and snowplay area.

The positive cumulative impacts would be just as they are for the No Action Alternative and Alternative 2.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

There are three potential impacts that would have long-term and lasting effects on the Peaks from a cultural perspective: 1) the addition of snowmaking technology (adding moisture to the Peaks at times when it is otherwise dry); 2) the use of reclaimed water rather than relying on natural precipitation to create snow; and 3) the removal of

vegetation and ground disturbance for the construction of trails and other infrastructure. Under all alternatives, the spiritual and cultural values of the Peaks as they relate to the tribes would continue to be impacted and are perceived by many Tribal members as irretrievable for as long as the current and proposed facilities exist within the Snowbowl SUP area.

Alternative 1 – No Action

While the historic and present impacts to the cultural and spiritual qualities of the Peaks are believed to be irretrievable in nature, with time, the SUP area could technically be reclaimed and infrastructure dismantled. Therefore historic and present cultural and spiritual impacts are not considered irreversible under the No Action Alternative.

Alternative 2 – The Proposed Action

With implementation of the Proposed Action there is the belief that there would be much greater disruption to the spiritual and cultural values of the tribes than currently exists, and the impacts would be longer lasting.

It is difficult to assess whether the impacts are irretrievable or irreversible in the case of snowmaking, as Tribal member believe it is the spirits who create rain. Many Hopi believe that with the addition of snowmaking technology on the Peaks, there is the possibility that the spirits would leave because they would no longer be needed (i.e., "if man can make his own moisture, they do not need the spirits…"). Even if snowmaking is suspended or removed for a period of time, it is impossible to determine for certain whether or not the spirits would return. While there is no means to assess whether the religious values would be permanently impacted with the utilization of snowmaking technology, based on the belief systems of many of the tribes we must consider at least a portion of these impacts as a potentially irreversible impact to these tribes' religions. In addition, the use of reclaimed water is believed by the tribes to be impure and would have an irretrievable impact on the utilization of the soil, plants and animals for medicinal and ceremonial purposes.

Additional vegetation and ground disturbance due to the construction of new parking lots, trails, lifts and infrastructure under the Proposed Action would impact the Peaks, as indicated in the analysis of direct and indirect effects. The impacts to physical/cultural/spiritual qualities of the Peaks can be regarded as irretrievable in nature, but not necessarily completely irreversible; because the ground could be allowed to recover over time should the Snowbowl facilities ever be disassembled.

Alternative 3

The impacts of Alternative 3 on the Peaks would be reduced as compared to those of the Proposed Action because snowmaking is not included. Nonetheless, under Alternative 3, additional ground and vegetation disturbance may represent an irretrievable impact to the spiritual integrity of the Peaks and to the utilization of soils, plants and animals for

medicinal and ceremonial purposes. However, with time the SUP area could be reclaimed and infrastructure dismantled. Therefore, these impacts are not considered irreversible.

3B. NOISE

SCOPE OF THE ANALYSIS

This noise analysis was conducted within, and adjacent to, Snowbowl's SUP area. This analysis was conducted in four phases:

1. **Ambient[76] noise level monitoring:** Sound level measurements were performed to help determine the existing ambient noise levels for this area.

2. **Noise Level Prediction:** Based on sound level data, and locations for the various equipment proposed to be used, noise levels were calculated and predicted for closest/worst-case receiving locations.

3. **Determined/Developed Acceptable Noise Level Limits:** Applicable studies, codes and standards were researched in order to determine the acceptability of the potential noise levels from the proposed operations.

4. **Conclusions:** Noise level predictions were compared with existing ambient noise levels and acceptable noise level limits.

EXISTING CONDITIONS

AMBIENT NOISE LEVELS

Based on professional judgment, ambient noise level measurements in the vicinity of the Snowbowl were collected at three locations: 1) the northwest section of the Snowbowl's base area – near the bottom terminal of the Hart Prairie Chairlift; 2) just off of Snowbowl Road, approximately ¼ mile southwest of the base area; and 3) in the Hart Prairie/Nature Conservancy area, along Forest Road 151 (and east of the road at the Wilderness boundary). Measurements were taken at the Snowbowl in order to obtain a baseline ambient noise level at the "source" location. The other measurement sites were selected to determine the ambient noise level at the "receiving" locations of concern (i.e., the nearest Wilderness and residential areas). Measurements were performed on Sunday night the 24th of August, 2003. Sunday night was selected because it was assumed that it would give the most conservative (i.e., the quietest) ambient levels. Weather during the measurement period was calm and clear with no wind.

The ambient noise levels are highly dependant on the amount of wind on a given night. Based on the noise level measurements, the ambient noise level at each of the three sampling locations could be 30 (dBA)[77], or lower, on a calm, clear night. However, with

[76] *Ambient* - (As used in this report) Typical background noise associated with a given environment excluding the specific noise under investigation and the transient noise from isolated identifiable sources.
[77] *dBA* - Sound pressure level expressed in decibels, filtered or weighted at the various frequencies to approximate the response of the human ear.

10 mile per hour winds, the ambient could exceed 43 dBA.

The existing noise sources in the area include snowmobiles, passenger vehicles and wind. The existing noise impacts from these sources to the receiving locations could range from 43-85 dBA. This is based on the following typical sound levels:

Table 3B-1
Typical Sound Levels from Various Sources

	50 Feet	250 Feet	1,000 Feet
Snowmobile (1)	85 dBA	71 dBA	59 dBA
Passenger vehicle (1)	67-71dBA	53-57dBA	41-45dBA
Wind	43+ dBA	43+ dBA	43+ dBA

Source: Acoustical Consulting Services, 2003.

EXTERIOR NOISE STANDARDS

There are no Coconino County or State of Arizona noise codes. Because the Snowbowl is outside of the city limits of Flagstaff, the ski area is not subject to Flagstaff's noise nuisance codes.

Typical municipal ordinances set not-to-exceed limits and consider instantaneous noise levels below 50 to 55 dBA at night and 60 to 65 dBA during the day to be acceptable. Some suburban and rural municipalities have set nighttime limits as low as 45 dBA.[78]

The only applicable national noise code is established in the US Housing and Urban Development Department (HUD) regulations. The potential noise from Snowbowl is not subject to HUD but is still in compliance. HUD sets forth the following exterior noise standards:

Table 3B-2
HUD Regulations for Exterior Noise

Rating	Threshold
Acceptable	65 L_{dn} [a] or less
Normally Unacceptable	Exceeding 65 L_{dn} but not exceeding 75 L_{dn}
Unacceptable	Exceeding 75 L_{dn}

[a] L_{dn} - Day Night average sound level (DNL) is the 24-hour average sound level, in decibels, obtained after the addition of 10 decibels to the sound levels occurring between 10:00 p.m. and 7:00 a.m.
[b] To achieve an acceptable status, appropriate sound attenuation measures must be provided

INTERIOR NOISE STANDARDS

HUD's regulations do not contain standards for interior noise levels. Rather a goal of 45 dBA is set forth and the attenuation requirements are designed to achieve that goal. It is assumed that with standard construction, any building will provide sufficient attenuation

Decibel - A unit for measuring the intensity of sound. The human hearing range is from 0 dB (the theoretical threshold of audibility) to 130 dB (the average pain threshold). The sound pressure level in decibels is equal to 10 times the logarithm (to the base 10) of the ratio between the pressure squared divided by the reference pressure squared. The reference pressure used in acoustics is 20 microPascals.

[78] Cowan, J.P., 1994

so that if the exterior level is 65 L_{dn} or less, the interior level will be 45 L_{dn} or less. According to the Environmental Protection Agency (EPA), the approximate national average Sound Level Reduction for homes is 25 dB.

TYPICAL AUDIBILITY OF COMMON NOISE SOURCES

The following table provides a reference for audibility and the typical sound pressure levels associated with common noise sources:

Table 3B-3
Noise Levels (dBA) For Common Noise Sources

Common Noise Source	Sound Pressure Level (dBA)	Subjective Evaluation
Human breathing at three feet	8-10	Just Audible
Quiet rural area or a bedroom at nighttime	25-30	Very Quiet
Wind in trees at 10 mi/hr or soft stereo music in a residence	40-45	Quiet
Birds at 10 feet or normal conversation at three feet	55-60	Moderate
Electric shaver at 1.5 feet	+/- 68	
Vacuum cleaner at 10 feet or a large dog barking at 50	70-75	Loud
Alarm clock ringing at five feet	+/- 80	
Lawn mower at five feet, food blender or garbage disposal at three feet	85-90	Very Loud
Train pulling hard at 100 feet	+/- 94	
Train siren at 50, motorcycle at 25 feet, car horn at 10 or a chain saw at two feet	100-110	Extremely Loud
Thunder nearby	+/- 115	
Hard rock band at 16 feet or a jet aircraft at 300 feet during takeoff	120-130	Painful
Jet aircraft at 75 feet or a long range gun at 0 feet	140	Deafening

ENVIRONMENTAL CONSEQUENCES

DIRECT AND INDIRECT EFFECTS

Issue:

The proposed snowmaking system would increase noise levels potentially disturbing residents, recreationists, and/or wildlife.

Indicators:

Modeled Analysis of Snowmaking-Related Noise Emissions Above Ambient Background Levels (Dba)

Modeled Analysis of Noise Dispersion to Define Audible Areas

Alternative 1 – No Action

The No Action Alternative would not result in any additional noise levels within, or in the vicinity of, the Snowbowl's SUP area. The existing noise sources in the area include snowmobiles, passenger vehicles and wind. The existing noise impact from these sources to the northwest of the Snowbowl base area, south of the Snowbowl near Snowbowl Road; and in the Hart Prairie/Nature Conservancy currently ranges from 43-85 dBA. Noise levels would not be expected to increase above existing levels.

Alternative 2 – The Proposed Action

With the Proposed Action, existing noise sources would remain, and would be compounded by the following potential noise sources:

- temporary construction vehicles and equipment
- snowmaking fan and tower guns
- water transmission pump stations
- snowmaking control building noise emissions

Temporary Construction Noise

Construction of the proposed projects, including: installing the reclaimed water pipeline between Flagstaff and the Snowbowl base area, snowmaking infrastructure, lift terminals and towers, buildings, and terrain modifications could include temporary noise sources such as heavy equipment (72-93 dBA at 50 feet), rock drills (81-98 dBA at 50 feet), and helicopters (65 dBA at 1,300 feet).

Fan Guns & Tower Guns (Snowmaking Equipment)

With implementation of the Proposed Action, there could be as many as 25 fan guns and 25 tower guns in operation at any one time. The proposed snowmaking system would likely be operating at 100 percent during the early season (late October through December), or as soon as ambient temperatures drop to suitable levels for making snow. Because of Snowbowl's irregular climate (as compared to other ski areas with snowmaking technology), all or part of the snowmaking system could be brought on-line at any time throughout the season to compensate for a lack of natural precipitation.

During the pre- and early season, snowmaking would likely occur at night, when temperatures drop. However; as daytime temperatures decrease throughout the season, the length of time over a 24-hour period in which snow could be made would increase.

Each tower gun produces an average noise level of 73 dBA at 200 feet and each fan gun produces an average noise level of 62 dBA at 200 feet.

Booster Stations

There is no specific noise data available for the booster station equipment. However, each of the pump stations would be enclosed in a concrete vault which would decrease exterior audibility of the pump substantially. According to the pump manufacturer the noise emissions from booster stations should not be audible beyond 100 feet.

Snowmaking Control Building

The proposed snowmaking control building would house additional pumps and air compressors. All equipment would be electrically powered and contained within the building. Due to the low noise emissions of the equipment and their containment with in the building, the control building equipment is not expected to be audible beyond 100 feet from the building.

Potentially Disturbed Areas

With the addition of potential noise emission sources, the following areas were investigated for potential to be affected: Hart Prairie residences, Fort Valley, and surrounding northern goshawk/Mexican spotted owl habitat.

Hart Prairie/The Nature Conservancy

The Hart Prairie area is located approximately 1.5 miles west (downhill) of the Snowbowl base area. Based on very conservative noise propagation modeling, this area could be affected by nighttime snowmaking noise levels as high as 38 dBA under certain atmospheric conditions.[79] At these distances, atmospheric conditions such as temperature and humidity can influence sound propagation. The projected 38 dBA is based on worst-case noise levels for various combinations of temperature and humidity.

During the construction period, Hart Prairie/Nature Conservancy area could be temporarily impacted by rock drills (37-54 dBA) and backhoes (28-49 dBA).

Although this potential temporary and permanent noise levels could exceed the existing minimum ambient noise level of = 30 dBA (see Existing Conditions) in the Hart Prairie/Nature Conservancy area, it would be well below the on-going noise sources in the area (snowmobiles, passenger vehicles and wind). As previously described, existing ambient noise levels in this area currently range from 43-85 dBA.

[79] Outdoor sound propagation models accounted for variables including distance, air absorption, ground attenuation, and vegetation, etc. The projected noise impact assumes all 50 snowmaking guns would be operating simultaneously.

Although the potential noise impacts to the Hart Prairie/Nature Conservancy area may be audible outdoors, the levels should not exceed typical noise standards. The projected maximum potential *outdoor* noise impact of 38 dBA detectable in Hart Prairie/Nature Conservancy area from snowmaking would be in compliance with the HUD standards provided in the Existing Conditions section.

Based on the HUD and EPA assumptions provided in the Existing Conditions section, the potential maximum *interior* noise level should not exceed 13-18 dBA at the Hart Prairie/Nature Conservancy area. The projected *indoor* maximum potential noise impact of 18 dBA would also be in compliance with HUD and all known interior noise standards.

As compared to the common noise sources presented in Table 3B-3, the subjective audibility of the operation of the snowmaking system would be "very quiet" to "quiet" with the temporary audibility of construction activities being subjectively characterized as "quiet" to "moderate."

Fort Valley Area

The Fort Valley residential area is located approximately four miles to the south of the Snowbowl SUP area. Given this distance and the attenuation of noise emissions, it is easily determined that operation of the proposed snowmaking system will not be audible within the Fort Valley area. The area may be temporarily affected by audible noise during the construction of the water transmission line from Flagstaff to the Snowbowl.

Northern Goshawk/Mexican Spotted Owl Habitat

An assessment of the effects of noise to both northern goshawk and Mexican spotted owl and their habitat areas was conducted as a portion of this analysis. Details of this analysis and a determination of effects are presented in the Wildlife Section of this document.

Alternative 3

The potential noise sources described within the Proposed Action are all dependant on the addition of snowmaking. With the elimination of snowmaking from the Proposed Action, (with the possible exception of temporary construction activities for the installation of lifts and building construction, etc.) noise levels would not increase above existing levels, as described.

CUMULATIVE EFFECTS

Scope of Analysis

Temporal Bounds

Proposed snowmaking infrastructure would increase the amount of noise generated throughout the Snowbowl winter operating season both during the day and at night for an indefinite amount of time (i.e., for as long as Snowbowl is in operation). Snowmaking operations would typically take place at night when ambient temperatures are lower than during the day. However, snowmaking would occur whenever ambient temperatures permit, especially during the pre- and early season.

Spatial Bounds

The affected environment relevant to a discussion of cumulative affects on "natural quiet" includes the area where noise generated by both construction activities (short-term) and normal operations (long-term) is heard by people. Similar to the aesthetics analysis, the ridge system that encloses the Snowbowl facilities also encloses sounds generated by ongoing activities at the ski area. Louder noises generated by ongoing Snowbowl activities, such as outdoor concerts, can be heard as far away as Humphreys saddle at the upper end of the Humphreys trail. Such noises diminish rapidly as topographic screening intervenes between the noise source and the listening receptor; though specific climatic conditions can cause such noises to travel well beyond the prominent topographic screening features. As noted in the discussion of direct/indirect effects, noise projected to the west of the Snowbowl SUP area, which is not bounded by topographic features, rapidly diminishes and approaches ambient noise levels by the time it reaches FR 151. Based on modeling conducted for this analysis, sound levels from normal snow gun operations (assuming 50 snow guns are in operation simultaneously) should be well below ambient natural sound by the time it reaches U.S. Highway 180, just over three miles from the sound source. Noise from construction would be louder than general operational noise and would carry farther, but would be short-term and intermittent and would only be heard during specific construction activities. Likewise noise from pipeline construction would be generated from outside the Snowbowl operational area but would only occur during construction of the project.

Past, Present, and Reasonably Foreseeable Future Actions

Past, present, and reasonably foreseeable projects that could cumulatively affect natural quiet include:

1. Veit Springs site and trail development
2. Bebbs Willow Restoration project in Hart Prairie
3. Residential and summer home development in Hart Prairie
4. Assorted and ongoing utility line clearing and maintenance
5. Snowbowl cellular tower (approved but not yet built)
6. Hart Hill restoration
7. Transwestern lateral pipeline construction
8. Arizona Trail – Peaks segment

Appendix C includes the full list of past, present and reasonably foreseeable future actions analyzed in this document, as well as background information on each of them.

With the exception of minor residential and summer home development and use in lower Hart Prairie, noise generated from all of these sources is anticipated to be intermittent and/or short-term (related to construction activities) in nature. None of the past, present or reasonably foreseeable activities identified above are anticipated to cumulatively combine with activities included under any of the alternatives analyzed within this document to result in measurably cumulative noise levels.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

With the exception of temporary, construction related disturbance to wildlife (which would be considered irretrievable), no other irreversible or irretrievable commitments of resources have been identified in this noise analysis.

3C. TRAFFIC AND SKI AREA ACCESS

SCOPE OF THE ANALYSIS

The scope of this traffic analysis is limited to U.S. Highway 180 (between the Snowbowl and Flagstaff) and the Snowbowl Road.

EXISTING CONDITIONS

SKI AREA ACCESS

Snowbowl Road is a seven-mile long Forest System road that is maintained by the Forest Service and the ski area. While the entire length of the 28 foot-wide Snowbowl Road is paved, curves and steep grades make for a necessarily slow approach to, and exit from, the ski area.[80] The present Snowbowl Road was designed in the mid-1980s following a snowy winter with high ski area attendance. While the Road was not constructed to a documented design capacity, it has been reviewed and is considered adequate to accommodate existing and peak day attendance at the ski area.[81]

Once guests reach the main base area, they have two options for parking. The Hart Prairie base area offers five parking lots. Approximately ¼-mile further up the road, four more lots are located adjacent to the Agassiz base area. Just past the Hart Prairie parking lots, vehicles often encounter skiers walking across the road to and from the Hart Prairie Lodge from the base of the Sunset Chairlift. The nature of multiple parking lots offered between two base areas, combined with a mix of pedestrian and vehicular traffic, provides for a less-than-ideal situation in terms of safety and general circulation.

PARKING

Guest parking is provided in nine lots (totaling approximately 10.3 acres) which collectively accommodate approximately 1,200 cars (116.5 cars/acre, allowing for snow storage and unavoidable lapses on the part of parking attendants). The parking areas are allocated with approximately 436 spaces in the upper lots adjacent to the Agassiz base area and 764 spaces in the lower lots proximate to the Hart Prairie base area. Applying an average occupancy rate of 2.5 passengers per vehicle, Snowbowl's parking areas currently have a capacity of approximately 3,000 guests. This parking capacity is more than adequate to accommodate Snowbowl's existing CCC of 1,880 guests but becomes the constraint to total visitation on peak days.

On peak days, attendance far exceeds the ski area's CCC. An analysis of the ten highest attendance days for each year between the 1992/93 and 2002/03 seasons indicates that the Snowbowl averaged 3,434 guests on peak days. Thus, peak days have historically averaged over 180 percent of Snowbowl's current CCC,[82] which tax the ski area's available parking capacity. Buses transporting guests from the Phoenix area park at the

[80] The posted speed limit is 30 mph for dry conditions.

[81] Standing, Paul, 2003

[82] As indicated in Chapter 1, ski areas typically design facilities to accommodate up to 125 percent of CCC.

overflow lots, as well. In assessing Snowbowl's current infrastructure, parking is currently the constraint limiting overall attendance.

TRAFFIC

The Snowbowl is accessed via Snowbowl Road (Forest Service Road #516), seven miles north of Flagstaff off of U.S. Highway 180. Traffic on U.S. Highway 180 related to Snowbowl's seasonal operations primarily occurs between Flagstaff and the Snowbowl Road, as there are essentially no population centers north of the Snowbowl Road that significantly contribute to attendance at the ski area.

The Data Section of the Arizona Department of Transportation's (ADOT) Transportation Planning Division is responsible for road and highway use data throughout the State. With some exceptions, Arizona's State Highway System consists of all roadways identified by wayside route number signing with an Interstate, U.S. or State shield. Traffic counting locations are marked along these roads by a small blue or white "TCS" (Traffic Counting Station) sign. Portable electronic vehicle counting and classifying equipment at these TCS stations is used to collect raw traffic volumes.

While ADOT has made many changes to Highway 180 over the past decade to improve safety and visibility, traffic typically spikes during the morning and evening rush (i.e., ingress and egress) between Snowbowl and Flagstaff. This is especially true on busy weekends and good snow days, and results in traffic being backed up on portions of Highway 180. This particularly affects residents from Cheshire Estates and Fort Valley.

Average Annual Daily Traffic

Raw data is processed and converted to average annual daily traffic (AADT) volumes. AADT is defined as the total volume of traffic on a road segment for one year, divided by 365 days. Both directions of traffic volumes are reported. AADT can be adjusted to compensate for monthly and daily fluctuations in traffic; the basic intent being to provide traffic volumes which best approximate the use of a given highway section for a typical day of the year.

Seasonal adjustment factors are developed from a network of automatic traffic recorders (ATRs). Currently, ADOT's Data Section operates 69 ATR stations statewide, which monitor vehicular traffic twenty-four hours per day each day of the year. These ATR stations are polled daily via telemetry and computer software to report the previous day's traffic activity. Traffic data polled from ATRs are stored and processed in both monthly and annual cycles, which are subsequently applied to raw counts taken on all highway segments that are assigned to a particular set of ATR stations.

While historic traffic volume data for U.S. Highway 180 between Flagstaff and the Snowbowl is somewhat limited, it has been collected at two locations: 1) between Schultz Pass Road and Snowbowl Road (approximately 3.5 miles south), and 2) between Snowbowl Road and Curley Seep Spring (approximately 13.5 miles north). AADT data for these two locations is presented for 1998 through 2000 in Table 3C-1.

Table 3C-1
AADT for U.S. Highway 180

Location	AADT 1998	AADT 1999	AADT 2000
Schultz Pass Road to Snowbowl Road (TCS MP[a] #222.80)	3,396	3,721	4,150
Snowbowl Road to Curley Seep Spring (TCS MP #223.00)	2,934	3,644	4,065

[a] Traffic Count Section Milepost Number
Source: Arizona Department of Transportation, June 2003

Skier visitation at Snowbowl between 1998/99 and 2000/01 is provided in Table 3C-2.

Table 3C-2
Snowbowl Skier Visits
1998/99 – 2000/01

Season	Visits
1998/99	35,205
1999/00	66,152
2000/01	162,175
2001/02	2,857
2002/03	88,000

Table 3C-2 provides a typical range of annual visitation at the Snowbowl which, incidentally, is directly related to annual snowfall (i.e., higher annual snowfall equates to higher annual visitation – refer to the Recreation Section of this chapter for more information). While a direct correlation between annual visitation at the Snowbowl and AADT for U.S. Highway 180 is difficult to make based on this limited data, it is logical to assume that fluctuating annual attendance at the Snowbowl has little direct impact on AADT for U.S. Highway 180. Correspondence with ADOT engineers confirmed that Snowbowl's wintertime operations, irrelevant of high or low attendance levels, have little impact on AADT for U.S. Highway 180.[83]

Average Daily Traffic

Average Daily Traffic (ADT) counts are typically useful in analyzing seasonal traffic patterns. ADT counts for U.S. Highway 180 at its intersection with Snowbowl Road are periodically collected by the City of Flagstaff, and are provided in Table 3C-3. In Snowbowl's case (due to the limited amount of data collected), this data is only marginally useful because the 2002 season was one of the worst on Snowbowl's records (48 inches of snow and just 2,850 total visits). Therefore, due to less snow and intuitively better driving conditions, ADT during February of 2002 (the only winter month collected) is assumed to reflect much lower than average Snowbowl traffic and likely higher than average Grand Canyon traffic.

[83] Gillick, July 2003; Flaherty, June 2003

Table 3C-3
ADT on U.S. Highway 180
(at Intersection with Peak View Road)

ADT	Month	Year
5,497	June	2001
3,283	February	2002
4,295	July	2002
4,464	October	2002

Source: City of Flagstaff, 2000-2002.

In addition to U.S. Highway 180, ADT counts have been collected for Snowbowl Road. This data is provided in Table 3C-4.

Table 3C-4
ADT for Snowbowl Road

ADT	Month	Year
158	August	2000
572	June	2001
231	February	2002
146	August	2002
710	October	2002

Source: City of Flagstaff, 2000-2002.

Data provided by the Flagstaff Metropolitan Planning Organization indicates that ADT for U.S. Highway 180 typically peaks during the summer months, and tapers off considerably during the wintertime.[84] This is due to utilization of U.S. Highway 180 by summertime travelers as the primary access route to the Grand Canyon.

By applying the average occupancy rate of 2.5 Snowbowl guests per vehicle discussed above, a generalization as to the Snowbowl's contribution to wintertime traffic volumes on U.S. Highway 180 can be made. Based on an exceptional season, such as 2000/01, in which annual visitation approached 163,000, approximately 65,000 vehicle trips on U.S. Highway 180 could be attributed to the Snowbowl's operations. On the opposite end of the spectrum, during a poor year such as the 1998/99 season, in which annual visitation only reached 35,000 guests, approximately 14,000 vehicle trips on U.S. Highway 180 and Snowbowl Road could be attributed to the Snowbowl's operations. A conservative estimate, in which these raw vehicular counts are converted to ADT between the months of December and March (four months) would equate to approximately 540 vehicles per day on the high end and approximately 115 vehicles per day on the low end. However, on peak days, which have historically occurred on a handful of days (approximately 10) each year as attributable to good snow conditions, holidays and long weekends, attendance at the Snowbowl has been shown to average 3,400 guests; the Snowbowl's contribution to ADT on U.S. Highway 180 could approach 1,360 vehicles per day.

[84] City of Flagstaff, 2000-2002

SNOWPLAY TRAFFIC

While in the past, snow on the San Francisco Peaks brought large crowds to NFS lands to snowplay (defined as sledding, tubing, saucering, building snowmen, etc.), this activity is not permitted within the Snowbowl SUP area. Prior to the 2002/03 winter season, the general public was attracted to the areas along the Snowbowl Road for dispersed snowplay activities. These activities created ongoing public safety issues including: snow sliding on non-directional equipment (sleds, saucers and trash bags) in wooded or steep areas, pedestrian/vehicular encounters, sanitation and refuse concerns, and difficulties for emergency vehicles passing through congested areas. During periods of abundant snow as many as 300 vehicles per day may have been parked along the Snowbowl Road belonging to visitors engaged in dispersed snowplay activities. Beginning with the 2002/03 winter season, the Forest Service has prohibited parking along the Snowbowl Road and initiated an active enforcement program. Although signs have been posted at the bottom of the Snowbowl Road informing visitors that snowplay is not allowed, scores of cars continue to drive up the road in search of snowplay opportunities. The majority of these visitors reach the Snowbowl base area only to be turned back by the ski area parking staff. On a peak day with good snow conditions, the Snowbowl parking staff may turn away as many as 500 cars full of visitors seeking an opportunity to play in the snow.[85] Unable to consistently discern skiing guests from snowplay visitors, the Snowbowl staff frequently is required to ask visitors found snowplaying in and adjacent to the parking areas and on the ski trails to leave. This creates an unfortunate and contentious situation for all involved.

ENVIRONMENTAL CONSEQUENCES

DIRECT AND INDIRECT EFFECTS

Issue:

The Proposed Action could affect traffic volumes and/or congestion on U.S. Highway 180 and/or the Snowbowl Road.

Indicators:

Historic and Projected Traffic Counts for U.S. Highway 180

Comparison of Anticipated Winter Traffic Volumes With Existing Winter Traffic Volumes and the Design Capacities Of U.S. Highway 180 and the Snowbowl Road

Relative Comparison of Existing And Anticipated Winter Traffic With Current Summer Traffic Volumes

Alternative 1 – No Action

Traffic

Generally speaking, future annual visitation levels under the No Action Alternative would be expected to resemble historic visitation, with possible slight increases attributable to

[85] Personal Communication with Snowbowl Management, 2003

regional population growth (refer to the Socio-Economic section for more details). Selection of the No Action Alternative, therefore, would not be expected to have any significant impact on current or future traffic volumes for either U.S. Highway 180 or Snowbowl Road. Seasonal traffic attributable to Snowbowl's operations under the No Action Alternative would continue to be dictated primarily by weather conditions (i.e., better natural snow conditions would be expected to induce visitation and associated Snowbowl-related traffic). Conversely, poor natural snow conditions (and therefore better driving conditions) on U.S. Highway 180 would likely lead to increased vehicular traffic between Flagstaff and the Grand Canyon.

As indicated in the Recreation and Socio-Economics sections, over the first eleven seasons following selection of the No Action Alternative, average annual wintertime attendance at the Snowbowl would be expected to hover around the historic average (as based on the past 22 seasons), which is approximately 105,000 visits. Applying 2.5 guests per vehicle, this equates to approximately 350 vehicles per day on U.S. Highway 180 between December and March (120 days) of each year that could be attributable to the Snowbowl's wintertime operations. Peak days, which have historically averaged approximately 3,400 guests, would be expected to occur on a handful of days each year under the No Action Alternative and could contribute as many as 1,360 vehicles per day on U.S. Highway 180.

As indicated, ADT on U.S. Highway 180 during the summer months is presumed to be much higher than during the winter. Under the No Action Alternative, Snowbowl's summertime operations would be expected to draw an insignificant amount of traffic, as no changes are proposed to the Sky Ride program. The summer Ski Ride program would be expected to continue to draw approximately 30,000 visitors each year between Memorial Day and Labor Day under the No Action Alternative, which would equate to approximately 95 vehicles per day on U.S. Highway 180 (at 3.5 persons/vehicle). Table 3C-5 provides recent as well as projected AADT for US Highway 180 in the vicinity of Snowbowl Road. The No Action Alternative is not anticipated to affect projections for 2020.

Table 3C-5
AADT for U.S. Highway 180

Location	AADT 1998	AADT 1999	AADT 2000	AADT 2020
Schultz Pass Road (MP 218.55) to Snowbowl Road (MP 222.94)	3,396	3,721	4,150	5,935
Snowbowl Road to Curley Seep Spring (238.58)	2,934	3,644	4,065	5,825

Source: Arizona Department of Transportation, June 2003.; Flaherty, June 2003.

No modifications or upgrades to the Snowbowl Road would be necessary under Alternative 1.

As described within the Recreation analysis (Section F), a demonstrated demand exists for dispersed snowplay activities and would continue to go unmet under the No Action Alternative. The areas along the Snowbowl Road would remain closed to parking, and therefore snowplay activities. Despite efforts to inform the public of the parking and snowplay prohibitions, it is anticipated that numerous visitors (up to 500 vehicles per day, in some instances) would continue to drive up the Snowbowl Road only to be turned away by the parking staff.

Parking

Under the No Action Alternative, parking capacity (approximately 3,000 guests) would continue to constrain daily visitation at the Snowbowl. Peak days would likely continue to contribute guest parking demand in excess of 180 percent of CCC.

Alternative 2 – The Proposed Action

Traffic

While average peak day attendance levels are not anticipated to increase under the Proposed Action, the frequency of these peak days is anticipated to increase throughout Snowbowl's winter operating season – which would be expected to contribute commensurate increases in seasonal traffic on U.S. Highway 180. Therefore, wintertime ADT associated with more consistent attendance at the Snowbowl would be projected to increase under the Proposed Action, as attributable to a more consistent snow pack (due to the installation of snowmaking), increased lift capacity, increased terrain, small increases in parking, and the snowplay facility.

As indicated in the Recreation and Socio-Economics sections, over the first eleven seasons following implementation of the Proposed Action, annual wintertime attendance at the Snowbowl would be expected to average approximately 185,000 visits. Applying 2.5 guests per vehicle, this equates to approximately 500 vehicles per day on U.S. Highway 180 between November 15 and April 15 (150 days) of each year[86] that could be attributable to the Snowbowl's operations. Peak days, which have historically averaged approximately 3,400 guests, would be expected to occur on a more frequent basis under the Proposed Action (due to more reliable and consistent snow conditions) and could contribute as many as 1,360 vehicles per day on U.S. Highway 180 and Snowbowl Road.

The snowtubing facility has been designed with a capacity of 600 tubers-at-one-time. However, it is assumed that the snowtubing facility would only approach full capacity on weekends and during holiday periods. The snowtubing facility's contribution to additional wintertime attendance at Snowbowl has been projected to fluctuate from 34,000 to 42,000 annual users.[87] While an average of 2.5 persons/vehicle is used to calculate parking and traffic for skiers, an examination of snowtubing guests at other ski

[86] The season length under the Proposed Action is assumed to be extended by approximately one month over Alternatives 1 and 3 due to the installation of snowmaking infrastructure.

[87] Snowtubing would only operate on weekends from Thanksgiving until December 22. At that point, the operation would begin daily operations. It is expected that the facility would operate until the third Sunday in March.

area facilities indicates that the ratio for snowtubers per vehicle is higher - at three persons/vehicle. Based on a 100 day operating season for the snowtubing facility, this equates to an ADT of approximately 113 to 143 vehicles on U.S. Highway 180 and Snowbowl Road. Peak day snowplay usage could approach as many as 1,680 guests[88] which would result in approximately 560 additional peak day vehicles.

As detailed within the Existing Conditions section, although signs have been posted at the bottom of the Snowbowl Road informing visitors that snowplay is not allowed, Snowbowl parking staff may turn away as many as 500 cars full of visitors seeking opportunities to play on a snowy day. In light of the current and on-going volume of snowplay traffic on the Snowbowl that is turned away at Snowbowl's base area, it can be reasoned that the proposed snowplay facility would contribute only a minor incremental increase in traffic on U.S. Highway 180 or Snowbowl Road.

Given a combination of peak day skier and snowplay facility attendance, peak day traffic on both the Snowbowl Road and U.S. Highway 180 may total approximately 1,920 vehicles. This total would represent an incremental increase above the base line condition of approximately 560 vehicles per day on a peak day. These totals would remain well below the summer and winter ADT for U.S. Highway 180. While design capacities for U.S. Highway 180 could not be obtained for this analysis, the Snowbowl Road was designed and constructed following a wet winter with high ski area visitation. The Snowbowl Road's ability to accommodate increased, more consistent, peak day traffic associated with the Proposed Action is not in question.[89] While overall peak day traffic is not anticipated to increase significantly under the Proposed Action, the frequency of busy days would increase across the course of the winter season.

As indicated, ADT on U.S. Highway 180 during the summer months is much higher than during the winter. Therefore, with implementation of the Proposed Action, Snowbowl's summertime operations would be expected to draw an insignificant amount of traffic on U.S. Highway 180, as only minor modifications are proposed to the Sky Ride program (i.e., the opportunity for guests to hike down from the top of the Agassiz Chairlift). The summer Ski Ride program would be expected to continue to draw approximately 30,000 visitors each year between Memorial Day and Labor Day under the Proposed Action, which would equate to an average of approximately 95 vehicles per day on U.S. Highway 180 (at 3.5 persons/vehicle).

Parking

Under the Proposed Action, skier parking would increase by approximately 0.3 acre, providing for an additional 35 vehicles. This would bring total spaces at the Snowbowl to approximately 1,235, accommodating roughly 3,087 skiers. In addition, construction of the 3.3-acre snowplay parking lot would provide roughly 400 spaces for snowplay use. While the snowplay facility has been designed with a capacity of 600 guests-at-one-time, the arrival and departure of guests in advance of and following a snowplay session will involve a considerable overlapping of parking needs. Additionally, by its nature,

[88] Assuming four, two-hour sessions per day at a 70 percent utilization rate.

[89] Standing, Paul, October 2003

snowplay activities attract a high percentage of non-participating attendants such as parents/grandparents accompanying children etc.

However, even with modest increases in skier parking called for in the Proposed Action, skier parking would continue to constrain overall skier attendance at Snowbowl.

Under the Proposed Action, no upgrades or modifications to the Snowbowl Road would be necessary, other than routine maintenance.

Alternative 3

Traffic

Under Alternative 3, wintertime attendance at the Snowbowl, and therefore associated traffic, is anticipated to increase slightly above the No Action Alternative, but far below that of the Proposed Action. Alternative 3 does not include snowmaking or installation of the snowtubing facility which are the two key components of the Proposed Action that would be expected to generate additional wintertime visitation and traffic. Therefore, projected traffic attributable to Snowbowl's operations under Alternative 3 would be significantly constrained by unreliable natural snowfall. However, small increases in projected traffic volumes in Alternative 3 (beyond the No Action Alternative) may be realized as a result of regional population growth, potential construction of the Humphreys Pod (additional lift capacity and terrain), small additions to parking, as well as trail grading projects. The trail grading projects included in Alternative 3 are designed to allow Snowbowl to open trails under reduced natural snow conditions, and thereby would be expected to contribute to incremental increases in annual visitation (assuming adequate natural snowfall) as compared to the No Action Alternative. Essentially the same year-to-year fluctuations in visitation, and therefore traffic, as presented in the No Action Alternative remain for Alternative 3.

As with the No Action Alternative, seasonal traffic volumes attributable to Snowbowl's operations under Alternative 3 would be primarily dictated by weather conditions (i.e., better natural snow conditions would be expected to induce visitation and associated Snowbowl-related traffic). Conversely, poor natural snow conditions, and therefore better driving conditions, on U.S. Highway 180 would likely equate to increased travel between Flagstaff and the Grand Canyon.

As indicated in the Recreation and Socio-Economics sections, over the first eleven seasons following implementation of Alternative 3, annual wintertime attendance at the Snowbowl would be expected to average approximately 110,000 visits. Applying 2.5 guests per vehicle, this equates to approximately 365 vehicles per day on U.S. Highway 180 and Snowbowl Road between December and March (120 days) of each year. Similar to the No Action Alternative, peak days, which have historically averaged approximately 3,400 guests, would be expected to occur on a handful of days each year under Alternative 3 and could contribute as many as 1,360 vehicles on U.S. Highway 180 and Snowbowl Road.

As indicated, ADT on U.S. Highway 180 during the summer months is much higher than during the winter. Under Alternative 3, Snowbowl's summertime operations would be

expected to draw an insignificant amount of traffic on U.S. Highway 180, as only minor changes are proposed to the Sky Ride program (i.e., the opportunity to hike down from the top of the Agassiz Chairlift). The summer Ski Ride program would be expected to continue to draw approximately 30,000 visitors each year between Memorial Day and Labor Day under Alternative 3, which would equate to approximately 95 vehicles per day on U.S. Highway 180 (at 3.5 persons/vehicle).

As described within the Recreation analysis (Section F), a demonstrated demand exists for dispersed snowplay activities and would continue to go unmet under Alternative 3. Under Alternative 3, the Snowbowl Road would remain closed to parking, and therefore to snowplay activities. Despite efforts to inform the public of the parking and snowplay prohibitions, it is anticipated that numerous visitors would continue to drive up the Snowbowl Road only to be turned away by the parking staff.

Under Alternative 3, skier parking would increase by approximately 0.3 acre, providing for an additional 35 vehicles. This would bring total spaces at the Snowbowl to approximately 1,235, accommodating roughly 3,087 skiers. Even with the modest increases in skier parking called for in Alternative 3, skier parking would continue to constrain overall skier attendance at Snowbowl.

CUMULATIVE EFFECTS

Scope of Analysis

Temporal Bounds

The temporal bounds of this cumulative effects analysis extend from the late 1930s, when Snowbowl was first established and began to draw vehicular traffic, into the foreseeable future in which the ski area can be expected to continue to draw summer and winter visitation.

Spatial Bounds

The spatial bounds of this cumulative effects analysis are limited to U.S. Highway 180, between the Snowbowl and Flagstaff, and along the Snowbowl Road.

Past, Present, and Reasonably Foreseeable Future Actions

Past, present, and reasonably foreseeable activities that could cumulatively affect traffic flows on U.S. Highway 180 and/or Snowbowl Road include:

1. Miscellaneous Facilities and trail construction within Snowbowl's SUP area
2. Snowbowl Road Parking Restrictions
3. Private land development
4. Miscellaneous/ongoing recreational uses
5. Snowbowl Road paving

6. Miscellaneous improvements projects along U.S. Highway 180[90]
7. Grand Canyon traffic

Appendix C includes the full list of past, present and reasonably foreseeable future actions analyzed in this document, as well as background information on each of them.

Alternative 1 - No Action

The previously mentioned past, present and reasonably foreseeable future activities have, and will, cumulatively affect seasonal traffic patterns along U.S. Highway 180 and the Snowbowl Road. Paving of the Snowbowl Road and parking restrictions along it have altered access and circulation. Likewise, miscellaneous improvement projects along U.S. Highway 180 over the past decade have increased visibility, safety and speed. While selection/implementation of the No Action Alternative would not increase traffic patterns, private land development and miscellaneous/ongoing recreational uses in the vicinity of the Snowbowl that are accessible from U.S. Highway 180 can be expected to continue to increase traffic in the study area. However, as indicated in the Existing Conditions section, data indicates that ADT for U.S. Highway 180 typically peaks during the summer months, and decreases considerably during the winter – as attributable to reduced Grand Canyon traffic.

Alternative 2 – The Proposed Action

Selection and full implementation of the Proposed Action would increase winter traffic on U.S. Highway 180 between Flagstaff and the Snowbowl. As noted in the direct/indirect analysis, average peak day skier attendance levels are not anticipated to increase under the Proposed Action. However; the frequency of these peak days is anticipated to increase throughout Snowbowl's winter operating season – attributable to a more consistent snow pack, increased lift capacity, increased terrain, small increases in parking, and the snowplay facility. When considered with other past, present and reasonably foreseeable future actions within the study area, this could lead to increased/more frequent congestion at the intersection of Snowbowl Road/Highway 180 and could further affect residents of Cheshire Estates and Fort Valley during the winter months.

In terms of ADT, seasonal Grand Canyon traffic would still be expected to overshadow Snowbowl-related traffic in the winter. This also holds true for the other noted past, present and reasonably foreseeable future projects.

Alternative 3

Under Alternative 3, winter attendance at the Snowbowl, and therefore associated traffic, is anticipated to increase slightly above the No Action Alternative, but far below that of the Proposed Action. When considered with other past, present and reasonably

[90] Correspondence with the City of Flagstaff's Traffic Engineering division indicated that there are no current or future projects (scheduled through 2008) that may cumulatively affect seasonal traffic patterns on U.S. Highway 180.

foreseeable future actions, Alternative 3 would represent a very slight cumulative increase in traffic patterns on U.S. Highway 180 and the Snowbowl Road.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

No irreversible and/or irretrievable commitments of resources in relation to traffic have been identified in association with any of the alternatives analyzed in this document.

3D. AESTHETIC RESOURCES

SCOPE OF THE ANALYSIS

The analysis area for aesthetic resources is the foreground, middle ground, and background views[91] of Snowbowl's SUP area.

While a general overview of the existing SUP area is provided in the Existing Conditions section, the aesthetics analysis for proposed activities has been based on the views from four representative viewpoints which were determined by the Forest Service ID Team:

- Hart Prairie (151 Road) – Summer
- U.S. Highway 180 at the Flagstaff Nordic Center – Summer
- Humphreys Trail (Wilderness Area) – Summer
- Interstate 40 East of Williams – Winter

The Environmental Consequences portion of this analysis provides a series of photographs taken from the representative viewpoints identified above. Each of the photographs depicts the existing condition and a simulation of the proposed changes.

The four selected view points represent those likely to be viewed by Forest visitors and serve as representative bench marks of aesthetic effects of the Proposed Action.

FOREST PLAN DIRECTION

FOREST SERVICE LANDSCAPE MANAGEMENT

The goal of landscape management on all NFS lands is to manage for the highest possible visual quality, commensurate with other appropriate public uses, costs, and benefits. Since the mid-1970s, the Forest Service has operated under the guidance of the Visual Management System (VMS) for inventorying, evaluating, and managing scenic resources on NFS lands. The VMS is defined in National Forest Landscape Management, Volume 2.[92] The VMS provides a system for measuring the inherent scenic quality of any forest area as well as a measurement of the degree of alteration for use in inventory and management.

VMS Visual Quality Objectives and Distance Zones

This aesthetics analysis utilizes Visual Quality Objectives (VQOs) as defined within the VMS. VQOs are based on the physical characteristics of the land and the sensitivity of the landscape setting as viewed by humans. VQOs define how the landscape will be managed, the level of acceptable modification permitted in the area, and under what circumstances modification may be allowed.

[91] Foreground, middle ground and background, as defined by the Forest Service, are detailed later in this section.

[92] USDA Forest Service, 1974

Viewing distance is important in determining how change is perceived across a landscape. Therefore, in addition to VQOs, the VMS uses distance zones to describe the part of a characteristic landscape that is being inventoried or evaluated. The three distance zones are described below.

> *Foreground*: The limit of this zone is based upon distances at which details can be perceived. Normally in foreground views, the individual boughs of trees form texture. The foreground is limited to areas within and not to exceed ½ mile of the observer, but it must be determined on a case-by-case basis, as any distance zoning should be. Generally, detail of landforms and special landscape features (including human alteration) are more pronounced when viewed within the foreground.
>
> *Middle ground*: Alterations in the middle ground (½ to four miles from the observer) become much less distinct. Texture normally is characterized by the masses of trees in stands or uniform tree cover. Individual tree forms are discernable in very open or sparse stands only.
>
> *Background*: As the perspective shifts to the background, distance has a modifying and diluting effect to both landscape texture and color. This zone extends from the middle ground (minimum of four miles between the observer and the area being viewed) to infinity. In very open or sparse timber stands, textures begin to be lost. Shape, however, may remain evident beyond 10 miles, especially if it is inconsistent with other landscape forms. Beyond 10 miles, alteration in landscape character becomes obscured.

FOREST PLAN DIRECTION

As per the Forest Plan, visual resource planning and inventory on the forest (pertinent to Snowbowl's operations) includes "Reviewing the VQO inventory as a part of project planning and making necessary corrections/refinements following field checking" and "Using the VQO inventory to analyze impacts to VQO classes due to management activities."[93]

Visual management direction specific to Management Area 15 includes managing for VQOs of *Retention* or *Partial Retention* with the exception of the Snowbowl. Visual resource management Standards and Guidelines specific to the Snowbowl SUP area are provided in the Forest Plan and direct that management activities meet the standards defined by the prescribed *Modification* and *Maximum Modification* VQOs at a minimum because of the developments (such as roads, parking areas, buildings, and lifts) and cleared runs.[94]

[93] USDA Forest Service 1987: 60

[94] USDA Forest Service 1987: 188-189

The *Modification* VQO is defined as:[95]

> Management activities may visually dominate the original characteristic landscape. However, activities of vegetation and land form alteration must borrow from naturally established form, line, color, or texture so completely and at such a scale that their visual characteristics are those of natural occurrences within the surrounding area of character type. Activities which are predominately introduction of facilities such as buildings, signs, roads, etc., should borrow naturally established form, line, color, and texture so completely and at such scale that its visual characteristics are compatible with the natural surroundings.

The *Maximum Modification* VQO is defined as:[96]

> Management activities of vegetative and landform alterations may dominate the characteristic landscape. However, when viewed as background, the visual characteristics must be those of natural occurrences within the surrounding areas or character type. When viewed as foreground or middle ground, they may not appear to completely borrow from naturally established form, line color, or texture. Alterations may also be out of scale or contain detail which is incongruent with natural occurrences as seen in foreground or middle ground.

SCENERY MANAGEMENT SYSTEM

In 1995 an updated landscape management system - the Scenery Management System (SMS) – was introduced by the Forest Service. The SMS was developed to eventually replace the VMS; its principles and premises are based not only research findings but on over 20 years experience with implementing the VMS. In October 1996, the manual, Landscape Aesthetics: A Handbook for Scenery Management[97] was released to begin the transition to the new SMS. National direction has been given to incorporate, as applicable, the methods and philosophy of the SMS with each new planning project.[98] The Handbook was accompanied by direction from the Forest Service's Washington Office to "begin using the concepts and terms contained in this Handbook as you work on new projects or initiate forest plan revisions."

As indicated, full adoption of the SMS is to occur as each National Forest revises its land and resource management plan. Direction for scenery management is contained within forest plan goals, objectives, standards, and guidelines. For Forests not currently undergoing the forest plan revision process, or for those requiring extensive time for revision, application of the SMS will occur at the sub-forest or project level.

[95] USDA Forest Service, 1973
[96] USDA Forest Service, 1973
[97] USDA Forest Service, 1995
[98] USDA Forest Service, 1994; 1996; 1997; and 1998

The 1987 Forest Plan predates the 1995 SMS and therefore the SMS has not been formally integrated into CNF management direction. Until the CNF Forest Plan is revised,[99] the VMS will continue to be utilized for inventorying, evaluating, and managing scenic resources on the forest. Therefore, this aesthetics analysis provides the following brief description of the SMS to determine consistency both with the current visual management system and its future successor.[100]

SMS terminology differs from the VMS, and updated research findings are incorporated. Conceptually, the SMS differs from the VMS in that it increases the role of constituents throughout the inventory and planning process and borrows from, and is integrated with, the basic concepts of Ecosystem Management. The SMS pertains primarily to the social/cultural dimension of ecosystem management – but also has links to the biological and physical.

The SMS measures the degree of "intactness" and "wholeness" of the landscape with "scenic integrity." SMS utilizes Scenic Integrity Levels (SILs) in much the same way that the VMS uses VQOs. The frame of reference for measuring achievement of SILs is the valued attributes of the "existing" landscape character "being viewed." The VQOs of *Modification* and *Maximum Modification* directly correspond to the SILs of *Low* and *Very Low*, respectively. .The two SILs are defined below:

SIL: *Low* (corresponds to *Modification* VQO):

> Refers to landscapes where the valued landscape character "appears moderately altered." Deviations begin to dominate the valued landscape character being viewed, but they borrow valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes or architectural styles outside the landscape being viewed. They should not only appear as valued character outside the landscape being viewed but compatible to the character within.

SIL: *Very Low* (corresponds to *Maximum Modification* VQO):

> Refers to landscapes where the valued landscape character "appears heavily altered." Deviations may strongly dominate the valued landscape character. They may not borrow from valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes or architectural styles within or outside the landscape being viewed. However, deviations must be shaped and blended with the natural terrain (landforms) so that elements such as unnatural edges, roads, landings, and structures do not dominate the composition.

[99] At the time of publication of this document, the CNF is in the initial stages of taking formal steps to proceed with its Forest Plan revision. The currently scheduled start date is FY 2006. Completion of the Forest Plan revision process will not likely occur until 2009 or after.

[100] Because the Forest Plan revision process for the CNF has not yet begun as of the publication of this EIS, this aesthetics analysis can only determine consistency with the SMS on a relative basis. Revised Forest and Management Area standards and guidelines, utilizing the SMS, have not yet been established.

The SMS utilizes the same distance zones as the VMS, however an immediate foreground distance zone is added in SMS which extends to 300 feet beyond the viewer.

EXISTING CONDITIONS

AESTHETIC CHARACTERISTICS OF THE SAN FRANCISCO PEAKS

The San Francisco Peaks are the remnants of a large, heavily vegetated composite volcano that last erupted roughly two million years ago. Rising more than a mile above the surrounding pine forests and grasslands of the northern Arizona landscape, the San Francisco Peaks exhibit a rich diversity of past geologic events such as lava flows, volcanic eruptions, glaciation, and erosion. The Peaks is an outstanding example of past volcanic activity and preserves the best example of Ice Age glaciation in Arizona in lateral and medial moraines and former streambeds.[101]

With its peaks reaching the highest elevation in Arizona, the San Francisco Peaks are a prominent feature of the southern Colorado Plateau. The three main peaks are Humphreys Peak (12,643), Agassiz Peak (12,356 feet), and Fremont Peak (11,969 feet). The other peaks are Doyle, Reese, and Aubineau. Views from the summit of the San Francisco Peaks stretch northwest to the Grand Canyon's North Rim; northeast across the painted desert (including Sunset Crater); and over eighty miles to the north. On a clear day, the Peaks are visible from over 100 miles away.

AESTHETIC CHARACTERISTICS OF THE SNOWBOWL SUP AREA

NFS lands within Snowbowl's 777-acre SUP area have been utilized for developed winter recreational use since 1938, when the ski area's original base area was established in Hart Prairie. Since that time, developed recreation at the Snowbowl has evolved and grown with the creation of additional trail systems, buildings, lifts, and infrastructure.

Snowbowl's SUP area is located on the western face of the San Francisco Peaks, and is defined by a prominent, V-shaped valley. The majority of Snowbowl's formal and gladed terrain can be found on this valley's north/northwest-facing aspects, with the exception of the Hart Prairie area, which has a predominantly west-southwest aspect. In all, the Snowbowl has 32 developed trails and approximately 130.4 acres of formal,[102] lift-served terrain within its SUP area. NFS lands within and immediately adjacent to the SUP area are defined by open bowls (at higher elevations), dense stands of spruce-fir throughout and well mature aspen stands in the lower elevations.

Snowbowl's base area facilities and parking areas are located at the Agassiz and the Hart Prairie lodges, located at 9,550 and 9,350 feet elevation, respectively. With the exception of chairlifts and the ski patrol head quarters (located at the top of the Agassiz Chairlift), no ski area infrastructure or services are located above the Agassiz Lodge.

With the exception of the Hart Prairie area (approximately 40 acres), which is a natural alpine meadow, approximately 100 acres of overstory vegetation have been removed

[101] USDA Forest Service, 1987: 101

[102] This does not account for undeveloped, skiable terrain (i.e., glades and naturally-open/hike-to terrain) within the SUP area.

throughout Snowbowl's development history. For the most part, cleared vegetation breaks have been "feathered" throughout the history of development in an attempt to avoid hard edges and to mimic natural breaks in the vegetation across the San Francisco Peaks. With some exceptions (noted below), the feathering technique has successfully reduced the potential visual effects of the developed terrain as compared to the surrounding, undisturbed natural landscape. The most obvious vegetation break in the SUP area is the corridor that was cut for the Agassiz Chairlift. The Agassiz Chairlift corridor, in particular, introduces a long linear element that that is absent from the surrounding natural landscape of the San Francisco Peaks.

Compliance with VQOs/SILs

Inevitably, the lift and trail network within Snowbowl's SUP area introduces some elements that are unrelated to features in the adjacent, natural landscape on the San Francisco Peaks. Despite the best efforts of the Forest Service and Snowbowl to blend the lift corridors and trails into the natural landscape, some unnatural vegetation breaks are quite obvious, particularly in the foreground view. However, once the observer moves to the middle ground and, especially, background views, the Snowbowl's trail and lift network begins to blend into the natural surrounding and becomes more difficult to distinguish.

Within the foreground view, the Snowbowl facilities are most frequently viewed by guests visiting the ski area. Therefore, developed facilities, trails, and lifts represent the anticipated landscape and are not a deviation from what most ski area visitors expect and value. The majority of viewsheds from which the Snowbowl can be seen from along the U.S. Highway 180 corridor fall into the middle ground and background views. However, the Snowbowl can be seen in the foreground view in certain instances. Because in Arizona developed winter ski areas are rare, these types of facilities are not expected by the majority of travelers who pass the Snowbowl on U.S. Highway 180. Therefore, in some cases Snowbowl's developed facilities are visible to those who may not expect or value the appearance of such facilities.

Nonetheless, the analysis completed indicates that Snowbowl's existing facilities, trails, and lifts corridors currently meet the established VQOs of *Modification* and *Maximum Modification*, and are consistent with Forest Plan direction. Therefore, when compared to the corresponding SILs of *Low* and *Very Low*, the analysis also concluded that the existing facilities are consistent with the SMS.

ENVIRONMENTAL CONSEQUENCES

DIRECT AND INDIRECT EFFECTS

Issue:

Proposed ground disturbance and vegetation removal within the SUP may incrementally affect the aesthetic quality of the west face of the San Francisco Peaks.

Indicator:

The Incremental Aesthetic Effects of the Proposed Projects Compared to Historic Landscape Alterations Within the SUP Area

Alternative 1 – No Action

Selection of the No Action Alternative would not directly or indirectly change Snowbowl's current operations, trail/lift network, or infrastructure. From an aesthetics standpoint, no changes to Snowbowl's SUP area would occur under the No Action Alternative and its facilities would continue to comply with Forest Plan VQOs of *Modification* and *Maximum Modification*. The description of existing conditions within this section describes both the history of landscape modifications and the present conditions which would persist with selection of the No Action Alternative.

Alternative 2 – The Proposed Action

Temporary Aesthetic Impacts

Some ground disturbing activities contained in the Proposed Action would be considered temporary in nature, since these areas would be promptly revegetated. These direct, temporary ground disturbing activities include: 1) installation of snowmaking pipelines on existing trails; 2) terrain grading on existing trails; 3) utility line installation; and development of the proposed snowplay facility. As quantified in Table 2-4 (located in Chapter 2), temporary ground disturbances under the Proposed Action would total approximately 236 acres. During construction periods, ground disturbances would be temporarily visible. As revegetation matures over a period of a few years, these disturbances would ultimately return to a condition similar to the present.

Permanent Aesthetic Impacts

Direct, permanent aesthetic impacts are associated with components of the Proposed Action that, whether occurring in new or previously disturbed areas, would represent long-term visible elements of the ski area's presence within the SUP area when perceived in either the foreground, middleground or background views. These elements include:

- Construction of the snowmaking water impoundment above the top terminal of the existing Sunset Chairlift
- Installation and realignment of chairlifts/surface lifts throughout the SUP area
- Construction of a 400-space snowtubing parking lot
- Construction of a hiking trail between the mid-station and the top terminal of the Agassiz Lift

- Construction of a 6,000 square foot addition to the Hart Prairie Lodge for a total of 24,900 square feet
- Construction of a 10,000 square foot guest services facility adjacent to the Agassiz Lodge
- Replacement of existing on-mountain ski team buildings with three new buildings
- Removal of approximately 76.3 acres of existing overstory vegetation associated with the development of skiing terrain, lift corridors, and tree thinning for construction of glades[103]
- Construction of a halfpipe (with a dirt form) below the bottom terminal of the Sunset Chairlift
- Construction of a snowtubing facility in the lower portion of Hart Prairie

Under the Proposed Action, permanent ground disturbances would total approximately 10.4 acres. While essentially all of these proposed projects would be visible in the immediate foreground view (i.e., from within the SUP area and isolated points from within the surrounding Wilderness), once the viewpoint extends further into the foreground view and into middle ground/background views, the dominating, permanent features of Snowbowl's Proposed Action become the lift and trail network. While vegetation removal associated with these projects can be considered permanent in nature, and would obviously incrementally add to the developed character of the SUP area, the visual simulations (see next section) conducted for this analysis indicate that visual sensitivities incorporated into the design of the proposed elements were successful in matching the form and texture of the surrounding landscape. This analysis determined that the proposed landscape alterations can be implemented while maintaining full consistency with the VQOs of *Modification* and *Maximum Modification*.

Alternative 3

Alternative 3 eliminates temporary ground disturbance associated with snowmaking line installation, but includes (essentially) all of the lift and trail additions contained in the Proposed Action. While Alternative 3 increases temporary ground disturbance associated with trail grading – necessary to provide for increased skiability under reduced natural snow conditions – overall temporary ground disturbances would be reduced to approximately 130 acres. Permanent ground disturbances are reduced under Alternative 3 by excluding the snowmaking water impoundment, snowtubing facility, snowtubing parking lot and the Aspen Chairlift realignment and would total approximately 1.7 acres. Additionally, Alternative 3 would result in the removal of approximately 64.4 acres of existing overstory vegetation associated with the development of skiing terrain, lift corridors, and tree thinning for construction of glades.

Overall, the aesthetic impacts are slightly reduced between alternatives 2 and 3. However, for the purposes of this analysis, they can be considered virtually identical, especially when perceived in the middle ground and background distance zones.

[103] Construction of gladed areas would required minimal removal of overstory vegetation (approximately 20 percent) and would concentrate on dead and dying timber. Therefore, construction of glades is not anticipated to significantly impact visual quality in the SUP area.

Indicator:

Visual Simulations, from Identified Representative Viewpoints, of the Proposed Landscape Alterations as Compared to the Existing Condition.

The reader is directed to figures 3D-1 through 3D-4 for photographs taken from the identified representative viewpoints. Each unaltered photograph is accompanied by an identical photograph that has been photo-simulated to depict proposed project elements which are anticipated to remain visually evident. For the purposes of this analysis, the Proposed Action and Alternative 3 can be considered identical when observed from these viewpoints, and are thus analyzed together.

Simulated views were analyzed from the following viewpoints:

- Hart Prairie (151 Rd) – Summer
- Hwy 180 at the Flagstaff Nordic Center – Summer
- Humphreys Trail (Wilderness Area) – Summer
- Interstate 40 East of Williams – Winter

Photo Simulation Methodology

Photo simulations represent a visually accurate method of realistically portraying proposed project elements on the existing landscape. These simulations are accomplished using a combination of GIS (Geographic Information Systems) and photo-editing software applications and the following techniques.

The first step in this process involved identifying the representative viewpoints from the surrounding landscape based on locations with high exposure and/or close proximity to the project area. These viewpoints are then photographed during the desired season to capture the baseline or existing conditions. The photographs are converted to digital images for simulation purposes.

Once the locations have been identified, the corresponding GIS data, such as trails, structures, vegetation lines, and proposed elements, are assembled. Once the pertinent data has been gathered, these GIS files are used to build a three-dimensional model specific to the scene portrayed in the image. The three-dimensional model identifies the viewable project elements for the selected perspective accounting for topography and vegetation which may lie between the observation point and the target view.

The three-dimensional model is converted and imported into an image editing software application. Using the digital image, the model is overlain and referenced to the original image. Using the proposed elements from the model as reference, a copy of the image is created simulating the proposed elements and features. The result is a spatially accurate, photo realistic simulation of the proposed project elements from the desired viewpoint.

Alternative 1 – No Action

Alternative 1, the No Action Alternative, represents The Arizona Snowbowl in its existing condition. No changes to the visual landscape would occur under this alternative. The

existing condition, and therefore the No Action Alternative is represented in the photo simulations as the baseline condition.

Alternatives 2 and 3

Figure 3D-1 displays the Snowbowl SUP area in the foreground distance zone looking south from the Humphreys Trail in the Kachina Peaks Wilderness. This viewpoint is representative of all views of the Snowbowl facility seen from this primary route into the Wilderness and is one of the best sites for viewing the proposed facilities and trails.

This middleground viewpoint presently falls within the basic standards of a "partial retention" VQO (Moderate SIL). The proposed developments would introduce additional elements (such as portrayed in the simulation) that in total would fall within the standards for a modification VQO as seen from all viewpoints along the Humphrey's Trail.

In the "Existing" view, although two existing trails - *Volcano* and *Casino* (trail #43a and #23*)* - are visible from this location, they remain partly obscured by existing vegetation that occurs along the trail edges. The *Midway Catwalk* and *White Lightning* (trails #24 and #28) appear as dark openings in the vegetation overstory and are essentially unnoticed. In the "Proposed" view, the proposed vegetation clearing from planned Trail 43b becomes moderately apparent as it causes the existing vegetative opening to continue uphill of *Volcano* (trail #43a) to the edge of the treeline occurring near the top of the Agassiz Chairlift. However, the portion of proposed Trail 43b that comes off of *Upper Ridge* (trail #26) across the existing Agassiz Chairlift corridor creates a gap in the existing vegetation that becomes visible due to its northwest aspect and location near the crest of Agassiz Ridge. A similar incidence occurs at the location of proposed Trail 38. Though not as noticeable, the trail clearing from Trail 38 occurs near the crest of Agassiz Ridge creating another depression in the existing vegetation. Although trail widening is proposed for *White Lightning* (trail #28), the impacts are not evident.

Figure 3D-1: Photo Simulation – Kachina Peaks Wilderness

Figure 3D-2 depicts the entire western face of the San Francisco Peaks in the middle ground distance zone. The picture was taken from the top of a small hill just west of Forest Road 151, looking east, from approximately 1.5 miles away. From this viewpoint, existing trails and lift corridors are easily distinguishable, particularly the Agassiz Chairlift and the following trails: *Lower Ridge* (trail #21); *Upper Ridge* (trail #26); *Rattlesnake* (trail #13); *Volcano* (trail #41a) and *Casino* (trail #23). In the "Proposed" view, the anticipated Sunset Chairlift corridor, terrain park, and trails 37, 38, 39 and 43b become most apparent due to their locations in the densely vegetated southern portion of the SUP area. The proximity of proposed trails 37, 38 and 39 to existing trails, combined with their direct western exposure, create a mosaic of new vegetative openings that become visible along the lower portions of Agassiz Ridge from this viewpoint. The proposed Humphreys pod, located just uphill of Hart Prairie, is also visible from this location. However, the proposed vegetation clearing in the Humphreys Pod is absorbed well due to the braided trail design and existing stands of tree islands that would remain.

The view from this middleground viewpoint presently falls well within the basic standards of the Modification VQO (low SIL) with the diagonal linear element of the Agassiz Chairlift being the most noticeable unnatural element visible. The proposed development would introduce additional elements that in total would fall well within the standards for the Maximum Modification VQO" (Very Low SIL) but would fall somewhat short of the Modification VQO standard.

Figure 3D-2: Photo Simulation – Forest Road 151

Figure 3D-3 shows the western face the San Francisco Peaks, with Agassiz Peak prominently displayed, in the background distance zone. The picture was taken from U.S. Highway 180 at the junction of the Nordic Center entrance road from a distance of approximately five miles. The bottom half of the Snowbowl's SUP area is obscured by foreground trees and vegetation from this viewpoint. Only existing and proposed trails with north and west orientations are visible from this location. Portions of the existing Agassiz Chairlift corridor and *Upper Ridge* (trail #26) and *Volcano* (trail #43a) are visible. In the "Proposed" view, proposed trails 37, 38, 39, 42, 43b and a portion of the Sunset Chairlift corridor become visible. While in a comparative format the proposed alterations are distinguishable, viewers at this distance are unlikely to notice a significant change.

Alterations seen from this viewpoint meet standards for the Modification VQO (Low SIL).

Figure 3D-3: Photo Simulation – Highway 180

Figure 3D-4 again shows the western face of the San Francisco Peaks in the background distance zone. The picture was taken during winter conditions on Interstate 40 East of Williams, approximately 16 miles away. From this distance only *Upper Ridge* (trail #26) can be distinguished while the remaining existing trails blend well with the surrounding natural vegetation. The "Proposed" view displays the addition of Trail 39 and the Humphreys Pod trail network. However, the location of the Snowbowl SUP area in the background zone makes the visual impact of the proposed trails virtually indiscernible when compared to the surrounding forest and canopy openings.

Alterations seen from this viewpoint meet standards for a Partial Retention VQO (Moderate SIL).

Figure 3D-4: Photo Simulation – Interstate 40

This analysis indicates that construction of all proposed projects could be accomplished while meeting the VQOs for *Modification* and *Maximum Modification*. In addition, implementation of these projects would be consistent with SILs of *Low* and *Very Low*.

CUMULATIVE EFFECTS

Scope of Analysis

Temporal Bounds

For the purpose of this cumulative assessment, it is assumed that visual impacts to the San Francisco Peaks landscape began with construction of the original ski area facilities in the late 1930s, increased with approval of projects analyzed in the 1979 EIS, continue to the present day and extend into the foreseeable future (i.e., as long as the Snowbowl operates).

Spatial Bounds

Table 3D-1 defines the spatial bounds of this cumulative effects analysis and identifies potentially effected viewers within each distance zone, as per the VMS.

Table 3D-1
Viewshed

VMS Distance Zone	Potentially effected Viewers
Foreground (out to ½ mile)	1. Snowbowl visitors/employees (large majority of users; expect to see ski area facilities) – view from access road and from Snowbowl 2. Local residents – (small number but growing and with high concern for scenic quality) – view from access roads and from summer homes in Lower Hart Prairie 3. Forest visitors other than Snowbowl visitors and residents. Includes Wilderness trail/trailhead, Arizona Tail/trailhead and those driving for pleasure
Middleground (½ mile out to four miles)	1. (see #1. above) 2. (see #2. above) 3. Forest visitors (majority of users affected), using U.S. Highway 180, FR 151, and other Forest roads and trails, people using Forest areas away from roads and trails (i.e. hunters/ cross country hikers)
Background (Four miles to infinity)	1. Forest visitors/travelers through the Forest – mostly people driving along highways 180 and 89 north of the Peaks with moderate to high concern for scenic quality. 2. Travelers along I-40 from just west of Flagstaff out to Williams

The affected environment relevant to a discussion of cumulative affects for aesthetic resources includes the extent of locations from which the analysis area is visible. This area extends from the Snowbowl generally to the north and west and diminishes as viewer distance increases and detail of alterations to the natural landscape diminishes. This also includes areas from which the proposed reclaimed water pipeline (that follows the existing Transwestern Lateral Natural Gas Pipeline corridor and existing roads) is visible. Areas to the south and east of the Snowbowl within the Kachina Peaks Wilderness have limited visibility into the Snowbowl SUP area up to the surrounding

ridge lines and peaks including views through tree cover along the upper part of the Humphreys Trail up to Humphreys saddle. Locations outside of the ridge system that encloses the Snowbowl facilities are screened from these affects by the mountainous topography and are not visible to the viewer on the ground. The existing facilities are visible to the discerning viewer from I-40 near Williams, approximately 25 miles away, when snow on the ground maximizes the contrast between the trail and lift corridors and the surrounding tree cover (referred to figure 3D-4). The area is also visible from the north side of Kendrick Park from U.S. Highway 180, about eight miles distant, but becomes undetectable due to topographic screening as the road proceeds north. The SUP area is not visible from Highway 89.

Past, Present, and Reasonably Foreseeable Future Actions

Past, present, and reasonably foreseeable projects which could cumulatively affect scenic resources include:

1. Veit Springs site and trail development
2. Bebbs Willow Restoration project in Hart Prairie
3. Residential and summer home development in Hart Prairie
4. Assorted and ongoing utility line clearing and maintenance
5. Snowbowl cellular tower (approved in August 2000 but not yet built)
6. Hart Hill restoration
7. Ongoing utility line construction and maintenance (on- and off-Forest)
8. Arizona Trail

Of the above-mentioned projects, Veit Springs site and trail development, Hart Hill restoration, Bebbs Willow Restoration, and the Arizona Trail are all within the spatial extent of the cumulative impact area, but are not of an extent or development scale/character to cause appreciable degradation to the natural appearing environment. The Hart Hill and Bebbs Willow Restoration projects will restore elements of the natural appearing landscape with possible short-term minor impacts to scenic quality.

Of the projects listed, projects most relevant to a discussion of cumulative effects to scenic resources include:

Residential and Summer Home Development in Hart Prairie

Ongoing development in Hart Prairie has introduced features not inherent to a natural appearing landscape within the middleground viewshed seen by people using the Snowbowl facilities and by others making use of the general area. Some of the developments occur as foreground elements from FR 151 with the Snowbowl facility seen behind the residences in the middleground. Residential developments in the area generally borrow from naturally occurring materials and color and occur at such a scale as to not contribute significantly to the overall visual quality of the area.

Residential and summer home development exists on private lands in Hart Prairie, below the Snowbowl facility. While generally borrowing from naturally occurring color and materials found in the area, the existence of these structures adds to the extent of the area

where the natural appearing landscape has been altered. Alterations to the natural appearing landscape within the residential/summer home area are less severe than within the Snowbowl facility due to the smaller scale of individual residential/summer home structures. While not bound by visual quality standards provided in the Forest Plan, these residential facilities generally fall within the guidelines for *Partial Retention* and *Modification* VQOs (*Moderate* to *Low* SIL).

Snowbowl Cellular Tower

Installation of a cellular tower near Snowbowl's maintenance shop was approved via a Decision Notice in August 2000. However, it has not yet been constructed. If constructed, this facility will introduce an incongruous element to a natural appearing landscape in the foreground viewshed of the Snowbowl facility as seen from the Snowbowl Road. This facility, if constructed, would meet a VQO standard of *Modification* (*Low* SIL) from foreground views and would meet the *Retention* VQO from FR 151 (middleground).

Ongoing Utility Line Construction and Maintenance

Ongoing utility line and pipeline clearance and maintenance highlights the contrast between utility and pipeline corridors and facilities and the natural appearing forest landscape. Clearing and maintenance activities will continue to produce unnatural appearing linear elements.

Appendix C includes the full list of past, present and reasonably foreseeable future actions analyzed in this document, as well as background information on each of them.

Alternative 1 - No Action

The existing Snowbowl facilities, when analyzed cumulative with residential/summer home development in the area, the cellular tower, ongoing utility and pipeline operation and maintenance, extends the area of *Partial Retention* to *Modification* scenic integrity (SIL *Moderate* to *Low*) from within the foreground view of the Snowbowl facility to the foreground view as seen from FR 151. From middleground and background views the effect of all of the cumulative elements discussed, except for the ski runs and lift tower corridors, diminishes and disappears for most forest visitors. As shown in the "before" photos (3D-1 through 3D-4) from middleground and background views, some of the existing ski trails and chairlift corridors are presently visible as unnaturally appearing shapes on the otherwise natural appearing landscape. The background and middleground views of the ski area facilities fall within the standard for a *Partial Retention* VQO (*Moderate* SIL) from the background to a *Modification* VQO (*Low* SIL) from middleground views.

Alternative 2 – The Proposed Action

Above and beyond those described in the No Action Alternative, the addition of facilities identified in the Proposed Action would have the following cumulative effects to aesthetic resources in the area:

- Foreground views from within the Snowbowl SUP area of snowmaking equipment, the water impoundment, snow tubing facilities, additional parking, lift installations and new buildings
- Middleground and background views of addition linear and feathered corridors. These corridors would cut diagonally through the existing tree canopy in contrast to the generally homogenous tree cover occurring on adjacent slopes of the San Francisco Peaks.
- Short-term ground disturbance within the existing Transwestern Lateral Natural Gas Pipeline corridor and along the access road corridor and the long-term effect of a wider corridor (in some locations) to accommodate Snowbowl's proposed reclaimed water pipeline. These effects are confined to the foreground of the pipeline, occur mostly outside of the viewshed affected by most of the other Proposed Action elements, and are not seen by most visitors to the area.

Alternative 3

The effect of adding facilities proposed with this alternative would be virtually identical to the PA excluding the effect of the reclaimed water pipeline and the snowtubing facility.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Additional developed terrain and infrastructure in previously undisturbed portions of the SUP area would represent irretrievable effects to visual resources for the useful life of the Snowbowl. However, this commitment of the visual resource is not irreversible because facilities and lifts could be removed and, in time, the area could be reclaimed and revegetated, restoring its natural appearance.

3E. SOCIAL AND ECONOMIC RESOURCES

SCOPE OF THE ANALYSIS

The development elements contained in the Snowbowl's proposal have the potential to affect not only the physical aspects of the project area's physical environment, but also the socioeconomic environment. Development of the proposed facilities has the potential to attract more skiers and other recreationists, to generate employment and to require additional public services. This analysis targets the specific issues within this broad framework as identified during scoping.

A correlation exists between the consistent operation of the ski area and the Flagstaff/Coconino County economy. This correlation encompasses; seasonal tourism; employment and income levels; and tax revenues. The strength of this correlation needs to be assessed and disclosed.

Socially, Snowbowl provides a source of wintertime recreation for a large number of people in northern and central Arizona. The relative importance of this local source of wintertime recreation needs to be assessed.

EXISTING CONDITIONS

POPULATION, HOUSING AND THE ECONOMY

In contrast with a number of other ski resorts in the Rocky Mountain region, the Arizona Snowbowl is not a dominant driver of growth and the economy in its host community. Coconino County and more particularly the City of Flagstaff have economies that draw upon a number of elements – including tourism and recreation – to maintain viability. Thus, while the Arizona Snowbowl's business activity is not the singular driver of the area economy and growth, the ski area's business activity does have a positive economic impact on the community and any major change in ski area activity – to the positive or negative – would be expected to have effects in the area.

Population, housing and the area economy are usually regarded as the most significant indicators of growth and are important to the Arizona Snowbowl from several perspectives:

- A growing population provides more potential customers for the Snowbowl's business.
- The regional housing stock provides housing for Snowbowl employees and, to a lesser extent, seasonal housing for Snowbowl visitors.
- A positive economy provides discretionary dollars for local residents and is likely to spur increases in recreational spending.

Further, these indicators are significant to a host community as measures of desired growth and ability to provide adequate housing for residents. The indicators are assessed

below, with a focus on Coconino County and the City of Flagstaff.[104] In addition, statewide data is shown for Arizona to provide comparative rates of change.

Population

The table below shows total population for Arizona, Coconino County and the City of Flagstaff for 1990 and 2000. In addition, estimated population is shown for 2002, along with absolute and percentage statistics regarding rate of growth.[105]

Table 3E-1
Total Population Change
Arizona, Coconino County, Flagstaff (1990 – 2002)

	1990	2000	Absolute Change 1990-2000	Percentage Change 1990-2000	Est. 2002	Absolute Change 2000-2002	Percentage Change 2000-2002
Arizona	3,665,228	5,130,632	1,465,404	40.0%	5,472,750	342,118	6.7%
Coconino Co.	96,591	116,620	19,729	20.4%	125,420	9,100	7.8%
Flagstaff	45,857	52,894	7,037	15.3%	59,160	6,266	11.8%

During the 1990s, the State of Arizona had a *strong* population growth rate of 40 percent. This compares to a U.S. population growth rate during the same period of 12.8 percent. While Coconino County and Flagstaff experienced solid population growth, their rates of growth were well below those for the state as a whole. However, it appears that recent growth rates for the county and city (2000 through 2002) have accelerated and that they are now experiencing population growth at rates exceeding that for the state as a whole.

Comparative distributions of populations by race in 1990 and 2000 are shown for Arizona, Coconino County and Flagstaff in the table below. The table shows the number and percentage of total population for each racial group.[106]

[104] City of Flagstaff is the only political entity for which data is consistently available within Coconino County and which is near the Arizona Snowbowl. Data is available for other communities that are remote from the Snowbowl's location. The Snowbowl is located within an unincorporated portion of the county.
[105] U.S. Bureau of the Census, Arizona Dept. of Employment Security-Population Statistics Unit.
[106] U.S. Bureau of the Census. Note that the Bureau used different systems for classifying race in the 1990 and 2000 censuses. In 2000, respondents were permitted to designate multiple racial backgrounds. The data in the table only includes figures for those who reported one race. Over 97 percent of all respondents indicated only one race in each of the three areas.

Table 3E-2
Racial Distribution of the Population[a]
Arizona, Coconino County, Flagstaff (1990, 2000)

		White		Black		American Indian, Eskimo or Aleut		Hispanic or Latino (of any race)	
		Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total
Arizona	1990	2,963,186	68.1%	110,524	2.5%	203,527	4.7%	688,338	15.8%
	2000	3,873,611	60.3%	158,873	2.5%	255,879	4.0%	1,295,617	20.2%
Coconino County	1990	61,836	58.2%	1,419	1.3%	28,233	26.6%	9,696	9.1%
	2000	73,381	56.9%	1,215	1.0%	33,161	25.7%	12,727	9.9%
Flagstaff	1990	36,519	69.1%	1,135	2.1%	4,210	8.0%	6,972	13.2%
	2000	41,214	67.1%	927	1.5%	5,284	8.6%	8,500	13.8%

[a] Data does not represent total population or every group accounted for in 1990 and 2000 census

Coconino County population has a substantially higher percentage of minorities than the state or Flagstaff populations. American Indians make up almost 26 percent of the county's population.

The table below shows population projections for 2005, 2010 and 2015 for Arizona, Coconino County and the City of Flagstaff.[107] In addition, comparative percentage change is shown for 2000 to 2005, 2000 to 2010, and 2000 to 2015.

Table 3E-3
Population Projections
Arizona, Coconino County, Flagstaff (2000 – 2015)

	2000	2005	Percentage Change 2000-2005	2010	Percentage Change 2000-2010	2015	Percentage Change 2000-2015
Arizona	5,130,632	5,553,849	8.2%	6,145,108	19.8%	6,744,754	31.5%
Coconino Co.	116,320	135,595	16.6%	147,352	26.7%	158,753	36.5%
Flagstaff	52,894	66,552	25.8%	71,981	36.1%	77,133	45.8%

While the state's population grew at a faster rate during the 1990s, projections call for above average population growth in Coconino County and City of Flagstaff for the period 2000 through 2015. It is expected that the city would grow at a particularly strong rate during the next 15 years. For purposes of comparison, projected rates of population for the U.S. as a whole are:[108] 2000 to 2005 - 2.2 percent, 2000 to 2010 – 6.6 percent and 2000 to 2015 – 11.0 percent.

[107] U.S. Bureau of the Census, Arizona Dept. of Employment Security. 2000 figure based on Census figure, all other figures Arizona projections.

[108] U.S. Bureau of the Census, Population Estimate Series, Middle Series

Overall, it is clear that Arizona as a whole, and Coconino County and Flagstaff in particular, would experience well above average rates of population growth during the coming years.

Housing

The table below shows total housing units for Arizona, Coconino County and Flagstaff for 1990 and 2000, as well as statistics on absolute and percentage change.[109]

Table 3E-4
Total Housing Units
Arizona, Coconino County, Flagstaff (1990, 2000)

	1990	2000	Absolute Change	Percentage Change
Arizona	1,659,430	2,189,189	529,759	31.9%
Coconino Co.	42,914	53,443	10,529	24.5%
Flagstaff	16,313	21,396	5,083	31.2%

Although Coconino County and Flagstaff population growth rates fell well below that for the entire state during the 1990s, Flagstaff's rate of housing increase matched that for the state, while the county's rate of increase did not fall substantially behind that for the state.

The table below contains more detailed data regarding year 2000 housing stocks for Arizona, Coconino County and Flagstaff including, total units, occupied units and owner and renter-occupied units.[110] In addition, comparative statistics are shown regarding the detailed data.

Table 3E-5
Housing Stock Details
Arizona, Coconino County, Flagstaff (2000)

	Arizona	Coconino County	Flagstaff
Total Housing Units	2,189,189	53,443	21,396
Occupied Units	1,901,327	40,448	19,306
% of Total	86.9%	75.7%	90.2%
Owner-Occupied	1,293,556	24,835	9,304
% of Occupied	68.0%	61.4%	48.2%
Renter-Occupied	607,771	15,613	10,002
% of Occupied	32.0%	38.6%	51.8%

[109] U.S. Bureau of the Census
[110] Id.

A review of the data reveals the following; 1) Almost 25 percent of Coconino County's housing stock is classified as vacant (see below); 2) The rate of housing ownership is lower than average in Coconino County and; 3) The rate of housing ownership is particularly low in Flagstaff. However, this is consistent with an urbanized center.

The table below contains more detailed data on 'vacant' housing stocks in Arizona, Coconino County and Flagstaff.[111] This includes total vacant units (and as a percentage of total housing stock) and vacant units classified as 'for seasonal, recreational or occasional use.'

Table 3E-6
Vacant Housing Stock
Arizona, Coconino County, Flagstaff (2000)

	Arizona	Coconino County	Flagstaff
Total Housing Units	2,189,189	53,443	21,396
Vacant Housing Units	287,862	12,995	2,090
% of Total	13.1%	24.3%	9.8%
For Seasonal, Recreational or Occasional Use	141,965	9,155	977
% of Total	6.5%	17.1%	4.6%
% of Vacant	49.3%	70.5%	46.7%

As noted above, Coconino County has an above average percent of vacant housing, while Flagstaff's vacant housing falls below the statewide average. A more detailed examination of the vacant housing stocks makes it clear that a substantial portion of the county's vacant stock (70.5 percent) is being held for seasonal, recreational or occasional use. There are over 9,100 housing units in the county that are held as vacation or second homes – accounting for 17.1 percent of the county's total housing stock. In comparison, only 6.5 percent of the state's total housing stock is held for the same purpose. This is an indication that the county is a significant draw to people seeking strong scenic and recreational values. Just as significantly, with 17.1 percent of the total housing stock held for seasonal use, there is substantial population fluctuation in the county dependent on the level of occupancy in these units. These non-local homeowners bring additional dollars to the local economy.

The Economy

With a population of over 115,000 persons and an urban center in Flagstaff, the Coconino County economy is driven by a number of elements. While the Arizona Snowbowl alone is not a dominant force in the economy, tourism, of which the Snowbowl is a part, is usually identified as the Flagstaff area's primary industry. While a number of factors play a part in tourism, it is clear that the presence of the Grand Canyon roughly 60 miles north of Flagstaff brings a substantial number of persons through the area. A summary of major economic indicators follows.

[111] Id.

The table below shows the distributions of Coconino County and Arizona employment by industry, as well as average wages by industry. [112]

Table 3E-7
Distribution of Employment by Industry and Average Wages
Coconino County, Arizona

	Coconino County			Arizona		
	Employ-ment	% of Total	Average Annual Wages	Employ-ment	% of Total	Average Annual Wages
Agriculture	349	0.7%	$22,680	56,853	2.5%	$18,404
Mining	108	0.2%	$24,480	5,365	0.2%	$48,892
Construction	2,689	5.3%	$28,388	164,771	7.3%	$35,628
Manufacturing	2,779	5.4%	$39,992	198,521	8.8%	$48,352
Trans/Utility	1,412	2.8%	$33,808	106,604	4.7%	$41,632
Wholesale Trade	942	1.8%	$41,400	108,228	4.8%	$49,168
Retail Trade	13,179	25.8%	$15,648	432,253	19.1%	$20,108
Fin/Insurance/RE	1,268	2.5%	$33,000	150,077	6.6%	$44,512
Services	14,770	28.9%	$27,200	662,640	29.3%	$34,676
Government	13,582	26.6%	$37,340	372,033	16.5%	$35,764
Non-Classified	14	0.0%	$23,500	2,782	0.1%	$43,592
Totals	51,092		$28,224	2,260,127		$34,648

An examination of the data shows that the Coconino County economy differs from the statewide economy in several ways. Most notably, the segment of workers employed in the Retail Trade and Government industries is notably higher in the county than in the state. The emphasis on Retail Trade is reflective of an economy dependent on tourism. Conversely, a comparatively smaller segment of Coconino County's workers are in Manufacturing and Finance/Insurance/Real Estate. The data also shows that county wage rates are significantly lower than statewide averages.

Labor force trends are also significant, as they reflect overall growth and the demands that jobs are creating for workers. From an employer's perspective, a growing labor force creates a pool from which to draw new workers. The table below shows changes in labor force and unemployment rates for the City of Flagstaff, Coconino County, the Flagstaff Metropolitan Statistical Area (MSA) and Arizona for the period 1998 through 2003.[113]

[112] Arizona Dept. of Employment Security. Figures for 2001.

[113] Arizona Dept. of Employment Security. All figures with exception of 2003 are annual averages. 2003 figures averages through July. The Flagstaff MSA is virtually the same geographic area as Coconino County.

Table 3E-8
Labor Force and Unemployment Rates
Flagstaff, Coconino County, Flagstaff MSA, Arizona (1998 – 2003)

	City of Flagstaff		Flagstaff MSA		Coconino County		Arizona	
	Labor Force	Un-employment	Labor Force	Un-employment	Labor Force	Un-employment	Labor Force	Un-employment
1998	30,512	5.8%	59,469	7.2%	56,850	7.3%	2,254.9	4.1%
2000	34,459	4.6%	66,855	5.7%	64,000	5.8%	2,480.0	4.0%
2001	35,324	4.3%	68,382	5.4%	65,525	5.4%	2,579.5	4.7%
2002	36,250	4.6%	70,202	5.8%	67,325	5.8%	2,671.7	6.2%
2003*	35,468	5.3%	68,898	6.6%	66,000	6.7%	2,660.0	5.8%
Change 1998-2002	18.8%		18.0%		18.4%		18.5%	

Labor forces in all of the comparative areas grew by similar amounts between 1998 and 2002. However, it should be noted that the Flagstaff MSA and Coconino County (similar areas) have generally experienced above average unemployment rates while the City of Flagstaff has enjoyed below average unemployment rates in recent years. 2003 data for all areas reflects the national and regional economic downturn of recent years.

Tourism

Tourism is a significant industry in the State of Arizona and in Coconino County/Flagstaff area. A recent report noted the following points:[114]

- By various estimates, two-to-five million visitors travel to Flagstaff on an annual basis.
- For Coconino County as a whole, it is estimated that over eight million persons visit on an annual basis.
- Tourism is estimated to account for 12 percent of the county's total income – this is four times the national average.

A year 2000 examination of the impact of tourism on the Flagstaff area economy indicated the following:[115]

- Tourism is the most significant economic activity in Coconino County.
- During the latter part of the 1990s, approximately 13,345 Coconino County residents were employed in the tourism industry.
- Of the 17 economic sectors in which tourism plays an employment role, 'Miscellaneous Amusement & Recreation Services,' was the fifth most important. This sector includes ski areas.

The table below shows total estimated visitors (Domestic and International) to Arizona on an annual basis for the period 1996 through 2001. In addition, total tourism related

[114] Morlock, B., 2001

[115] Morrison Institute for Public Policy, January 2000

employment (Direct and Indirect) as well as the total economic impact of statewide tourism is shown.[116]

Table 3E-9
Visitation and Economic Impacts of Tourism Activity
Arizona (1996 – 2001)

	Visitors in Millions					
	1996	**1997**	**1998**	**1999**	**2000**	**2001**
Domestic Visitors	23.70	25.60	25.10	26.80	26.80	27.1
International Visitors	2.47	2.54	2.55	2.62	2.73	***NA***
Total Visitors	26.17	28.14	27.65	29.42	29.53	
Tourism Related Employment (Direct & Indirect)	326,542	347,202	358,685	366,236	375,502	377,621
Economic Impact ($Billions)	$11.1	$11.4	$12.3	$12.7	$13.8	***NA***

In recent years, Arizona has attracted almost 30 million visitors on an annual basis. Just as significantly, direct and indirect tourism employment totals over 375,000 jobs and creates almost $14 billion in annual economic impact.

With two major tourism attractions – Grand Canyon National Park and Glen Canyon National Recreation Area – Coconino County attracts a substantial segment of Arizona's tourism activity. Recent estimates have placed total estimated visitation in the county in the eight-to-nine million range, or approximately 30 percent of Arizona's total activity level.[117]

In summary, it is clear that tourism is critical to the Coconino and Flagstaff area economies and that the Arizona Snowbowl is one of a number of regional attractions that play a role in attracting tourism activity. The Snowbowl is a unique attraction in that it is a winter oriented facility in a region that is commonly perceived as being oriented toward warm weather activities.

Skiing

From a statistical perspective, Alpine skiing accounts for a minor segment of the State of Arizona's travel activity. With an average of just under 300,000 skier visits during the most recent seven seasons, skiing volume does not have a major impact on statewide visitation.[118] However, skiing's impact is more significant from several qualitative perspectives, as explored in more detail below. Skiing brings winter-oriented travel activity to the state – a group that otherwise might not make travel expenditures in Arizona. Further, based on historical usage records at the Snowbowl, it is apparent that

[116] Arizona Office of Tourism, Office of Tourism Research Library

[117] Bureau of Business & Economic Research, College of Business Administration, Northern Arizona University

[118] Skier visits include Alpine skiers, telemarkers and snowboarders.

there is strong demand for skiing; the Snowbowl is typically used at or near its capacity level on days when there is good or excellent quality skiing.

The table below shows annual skier visits for the U.S., the Pacific West region (includes Arizona), all of Arizona, and for the Arizona Snowbowl for the 1996/97 through 2002/03 seasons.[119] The table also shows year-to-year percentage change in total visits.

Table 3E-10
Annual Skier visit Totals
U.S., Pacific West Region, Arizona, Arizona Snowbowl
(1996/97 – 2002/03)

	Annual Skier visits						
	1996/97	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
U.S. (Millions)	52.52	54.12	51.96	51.65	57.34	54.40	57.60
% Change		3.1%	-4.0%	-0.6%	11.0%	-5.1%	5.9%
Pacific West (Millions)	9.84	11.17	11.08	10.61	11.28	12.13	10.60
% Change		13.5%	-0.8%	-4.3%	6.3%	7.5%	-12.6%
Arizona (State)	365,787	384,665	246,941	243,685	355,780	214,135	277,305
% Change		5.2%	-35.8%	-1.3%	46.0%	-39.8%	29.5%
Arizona Snowbowl	153,176	180,082	35,205	66,152	162,175	2,857	87,354
% Change		18%	-80%	88%	145%	-98%	2,958%

While there has been much discussion of a 'flat market,' U.S. skier visit trends have generally been positive in recent years, with the 2002/03 season setting an all-time record. While there are fluctuations, the overall trend has also been positive for the Pacific West region – which represents a *broad* geographic spectrum, from Alaska to Arizona. The data also makes it clear that the level of fluctuation in the Arizona market is much more significant that at the regional or U.S. level and that the level of year-to-year fluctuation in skier visits is *extreme* at the Arizona Snowbowl. Roughly 82 percent of the ski areas in the U.S. have snowmaking facilities that allow them to more consistently provide a skiing product.[120] Because the Snowbowl does not have snowmaking, its ability to provide a skiing product is far less consistent. Not surprisingly, operational records for the Snowbowl indicate that the number of days of operation in any season is closely related to skier visit totals.

The table below shows total Arizona skier visits as a percentage of the Pacific West market and Arizona Snowbowl skier visits as a percentage off the Arizona market for the 1996/97 through 2002/03 ski seasons.

[119] National Ski Area Association (NSAA) *Kottke National End-of-Season Surveys* and the Arizona Snowbowl. The Pacific West region, as defined by NSAA, includes Nevada, Arizona, California, Oregon, Washington and Alaska.

[120] Based on respondents to NSAA annual survey 2002/03.

Table 3E-11
Arizona and Arizona Snowbowl Skier visits as Percentage of Larger Markets
(1996/97 – 2002/03)

	1996/97	1998	1999	2000	2001	2002	2003
Arizona as % of Pacific West Market	3.7%	3.4%	2.2%	2.3%	3.2%	1.8%	2.6%
Arizona Snowbowl as % of Arizona Market	41.9%	46.8%	14.3%	27.1%	45.6%	1.3%	31.5%

During the past seven seasons, total Arizona skier visits have averaged only 0.5 percent of the U.S. market as a whole. While Arizona's share of the Pacific West market is more significant, it remains at a relatively low level, with a fair amount of variability. Over the past seven seasons, Arizona Snowbowl skier visits have averaged 29.8 percent of the Arizona market. However, market share has varied dramatically – from 1.3 to 46.8 percent – again pointing to the variability of the Snowbowl's business due to lack of consistent snow. The Snowbowl's highly variable share of the Arizona market makes it clear that the ski area's competitors within the state enjoy a more stable flow of business from year-to-year.

Arizona Snowbowl Employment

Ski operations at the Arizona Snowbowl create a significant amount of employment. During the past seven seasons of operation (1996/97 through 2002/03) the Snowbowl employed an average of 22.1 persons on a full-time, year-round basis, 272.4 persons on a full-time seasonal basis and 204.3 persons part-time, seasonal basis. During the same seven seasons, the average number of persons employed during the peak week of employment was 370.3. For purposes of this analysis, the employment values have been converted to Full-Time-Equivalents (FTEs) for comparisons with projections of future employment levels.[121] During the past seven seasons, the Arizona Snowbowl provided an average of 172.0 FTE jobs.

Although the Arizona Snowbowl does not 'drive' the Flagstaff area economy, it is apparent that the ski area is a provider of jobs and that ski area visitors are positive contributors to the area economy.

[121] One Full-Time-Equivalent is sufficient work to employ one worker on a full-time basis for one year. Total employed to FTE conversion rates used for this analysis are as follows: Full-Time Year-Round = 1.0 FTE, Full-Time Seasonal = 0.4 FTE and Part-Time Seasonal = 0.2 FTE.

ENVIRONMENTAL CONSEQUENCES

SUMMARY OF ENVIRONMENTAL CONSEQUENCES AND CONCLUSIONS

Major conclusions and determinations of this Social and Economic Resources analysis are summarized below. A more detailed analysis of the direct and indirect environmental consequences – from which this summary was derived – follows.

- The City of Flagstaff and Coconino County have experienced solid growth in recent years. Further, their rates of growth appear to have accelerated since 2000. Economic data makes it clear that tourism is a significant component of the Flagstaff area economy. It is estimated that over 24 percent of the Flagstaff economy is generated by tourism activity. While local events and weather do have short-term impacts on tourism volume, year-to-year totals are primarily driven by events in the U.S. macro economy. The significance of recreational activity and scenery in Coconino County is further established by an assessment of the housing stock; 17.1 percent of the county's total housing stock is held for seasonal or recreational purposes. This compares to 6.5 percent for all of Arizona.

- The Arizona Snowbowl is a positive contributor to area tourism and thus, the Flagstaff area economy. The Snowbowl generates jobs, draws dollars to the local economy via visitor expenditures at area businesses and is significant to the area in that it offers a winter attraction in a region that is typically oriented toward summer tourism. However, in an economy of this size, and with countywide tourism drawing over eight million visitors annually, it is unrealistic to think that the Snowbowl would be a significant driver of tourism activity or the economy. This is a positive, as communities in which a ski area is the most significant economic engine are often too affected by the ups and downs of those businesses.

- The Snowbowl has been unprofitable in four of its most recent 11 operating seasons. Without question, variability in natural snowfall and the lack of a snowmaking system have been the primary factors resulting in unprofitable seasons. Moreover, net cumulative profits, during those 11 seasons have been more than exhausted by on-going maintenance needs and small capital investments in the ski area. These capital investments have only been sufficient to maintain the ski area at its current level of quality and maintenance, and have not included any major improvements to increase competitiveness. Under these circumstances, continuation of the current operation as a for-profit business may not be sustainable; the ski area would likely decrease expenditures on maintenance and non-essential services leading to an overall reduction in the quality of the services offered.

- With an annual average of less than 300,000 skier visits, Arizona's ski industry is not a major player in the U.S. ski market. However, the state's ski areas are significant to the state's recreational offerings in that they offer a winter-based attraction in a state that is primarily oriented toward warm weather activities. The Arizona ski industry shows more variability in year-to-year skier visit totals than does the U.S. industry. Year-to-year skier visit totals at the Snowbowl are *extremely* variable when compared to the industry as a whole. This is a factor of absolute reliance on natural snowfall. For the industry as a whole, the installation of snowmaking systems is the standard for mitigating the impacts of variable snowfall.

- The Snowbowl currently *averages* 98,000 skier visits annually, but the annual figure varies dramatically, dependent on natural snowfall. The major positive economic impact of the Snowbowl is triggered by visitor expenditures – both at the Snowbowl and at other area businesses. Any significant change in the Snowbowl's economic impact – either to the positive or negative – will be triggered by changes in visitation levels. Further, the consistency of the ski area's economic impact would be affected by changes that would reduce the variability in year-to-year visitation totals.

- Currently, Snowbowl visitors average direct expenditures of $9.79 million annually in Coconino County, including spending at the Snowbowl and at other area businesses. This spending directly supports 190 full-time job equivalents (FTEs). When the Snowbowl's full range of direct and indirect economic impacts are considered, the ski area currently supports 232 FTEs and $12.08 million in economic output in the private sector.

- The Snowbowl's current public sector inputs include an annual average of $90,000 in fee payments to the Forest Service, $257,000 in state and county sales taxes and $36,000 in county personal property tax. These payments help to support a number of local programs and services, including: schools, libraries and the fire district.

- The Snowbowl is a significant recreational/social asset to the Flagstaff area:

  - The Snowbowl is the primary winter recreational attraction in the area.
  - The Snowbowl provides access to an Alpine environment to those who would otherwise not be able to visit this area.
  - The Snowbowl provides support – both programmatic and financial – to a number of area groups.

Alternative 1 – No Action

- Under this alternative, the ski area would continue operations with the existing facilities. While the Snowbowl has operated in its current form for a number of years, the financial analysis makes it clear that this may not be a viable business model – the business has been unprofitable in four of 11 years and the required capital investment has more than exhausted profits over that period. Thus, a continuation of the current operation and level of services would probably not be regarded as sustainable by a typical owner or investor. While there is a demonstrated market for quality skiing in the Flagstaff area, the absence of natural snowfall in a number of years would keep the ski area from achieving a sustainable business position. A typical owner/investor would eventually be forced to significantly curtail operations by reducing capital investment/maintenance expenditures and the level of services being provided.

- Assuming continued operations, the alternative would result in a small increase in visitation over the 10 year planning period; from an annual average of 98,000 to 110,000, primarily in response to regional population growth. However, annual totals would continue to be highly variable (plus or minus 70 percent from the average) due to variability in natural snowfall.

- Increases in average visitation would result in some additional economic impact. At the end of the 10 year planning period, these added expenditures would support an additional 11 FTEs and $1.47 million in economic output. Thus, the ski area would support a total of 261 FTEs.

- Increases in ski area activity would support minor increases in average annual Forest Service Special Use Permit and sales tax payments.

Alternative 2 – The Proposed Action

- Under this alternative, the Snowbowl would experience a major improvement in the skiing facility, create an entirely new snowtubing/snowplay area, significantly improve skier services and, put a snowmaking system in place. The snowmaking system is the most significant improvement from an economic impact perspective; snowmaking would allow the ski area to *consistently* operate with quality skiing conditions an average of 125 days per season. With a proven demand for quality skiing in this market, a consistent operating season would allow the ski area to significantly increase total annual visitation. Increases in visitor expenditures are closely correlated with a positive economic impact.

- The alternative would result in a significant increase in total visitation over the 10 year planning period; from an annual average of 98,000 to 257,000 (includes skiers and snowplayers). Year-to-year variations in visitation would be minimized (plus or minus 15 percent) because of the inclusion of a snowmaking system.

- The short-term impacts of the construction of the alternative's improvements would result in the creation of 232 FTEs and $21.24 million in economic output in Coconino County.

- Increases in average visitation would result in a substantial positive economic impact. At the end of the 10 year planning period, these added expenditures would support an additional 331 FTEs and $17.23 million in economic output. Thus, the ski area would support a total of 564 FTEs in Coconino County. This would be a significant result; a substantial number of Flagstaff area residents would gain employment opportunities as a result of increased activity at the Snowbowl.

- The alternative would result in substantial increases in fees and taxes paid to the public sector. At the end of the 10 year planning period, it is projected that the Snowbowl would pay an annual average of $193,000 in Forest Service Special Use Permit fees, $650,000 in state/county sales taxes and $455,000 in county personal property taxes. Significantly, these fees/taxes would not vary substantially from year-to-year because ski area visitation would be more consistent in response to the installation of the snowmaking system. These fees and taxes would be significant sources of support for local programs and services, including schools, libraries and the fire district.

- The Snowbowl's function as a recreational/social facility in the Flagstaff area would be enhanced and secured. With a larger facility and more secure financial base, the Snowbowl would be able to increase its role in the community – both from programmatic and resource perspectives. Further the addition of a snowplay area would enable a new demographic of guests to gain access to snow and the Alpine environment.

Alternative 3

- It is highly unlikely that Alternative 3 would ever be fully completed, either by current or future Arizona Snowbowl owners. Alternative 3 would include significant improvements to ski facilities, but the alternative does not include snowmaking. As such, skier visits and thus revenues would continue to fluctuate dramatically. With a higher break-even resulting from the investment in Alternative 3 improvements, the ski area would be unprofitable a high percentage of the time. Given these circumstances, a rational owner/investor would not make the choice to complete all of the Alternative 3 project elements. At most, an owner/investor might make several of the minor improvements included in the alternative; these improvements would likely have little or no impact on skier visitation and ski area viability. In the event that an owner/investor were to fully complete the Alternative 3 improvements, the ski area would be placed in a highly tenuous financial situation potentially leading to the cessation of business operations within several years. In that event, the Snowbowl's current positive economic benefits would be lost.

- Because Alternative 3 is unlikely to accomplished, the effective economic impact would be similar to that for Alternative 1; minor increases in visitor expenditures would support some additional employment and dollar flows in the local economy and small increases in public sector fees and taxes. Further, the Snowbowl would continue to operate in a highly tenuous business situation, one that might not be sustainable over a period of years.

- In the unlikely event that Alternative 3 were to be completed, any increases in skier visits and expenditures would be short-term. Because visitation would continue to fluctuate dramatically, and the ski area's break-even level would increase, the operation would be tangibly unprofitable and could potentially cease business operations within several years. Under this situation, a significant number of persons would no longer be employed – both at the Snowbowl and at other area businesses that are supported by visitor spending.

DETAILED ANALYSIS OF DIRECT AND INDIRECT EFFECTS

Issue:

Implementation of the Proposed Action may have social and economic effects on Flagstaff and Coconino County.

Indicator:

The Potential for the Proposed Action to Affect a Change In Key Local Economic Indicators (Population; Long- and Short-Term Employment, Housing, and Tax Revenues, etc.).

Impact Analysis Methods

A variety of information and data sources were utilized to develop the analysis of economic impact. Capital cost estimates for the alternatives were developed in conjunction with Arizona Snowbowl ski area planners. Skier visit projections for the alternatives were developed based on historic data from the Arizona Snowbowl, projections regarding increases in facility scope and information regarding market area growth from the U.S. Bureau of the Census and the Arizona Department of Employment Security. Data on skier expenditures were based on surveys of skier expenditures from several western states (including Utah and Colorado) as well as surveyed expenditures by Arizona Snowbowl skiers from University Associates, Inc. An IMPLAN input-output analysis was conducted to determine total effects from construction, employment, and visitor expenditures.

The economic impact analysis was accomplished in several major steps:

1. *Skier visit Projections* – average level visit projections were prepared for a point 10 years following the completion of each alternative. (In addition, a snowtubing visit projection was prepared for Alternative 2.) The visit projections were based on the improvement – or lack of improvement – that each alternative would offer as well as background factors. The factors that were considered included; change in lift capacity, change in skiing terrain, development of a tubing/snowplay facility, change in parking capacity, development of snowmaking capability and potential population growth in the region.

   Based on the most recent seven seasons of operation, the Arizona Snowbowl averaged just over 98,000 skier visits per season. However, it is essential to note that this is only an average figure and that, due to inconsistent snowfall, the year-to-year figure fluctuates dramatically. During the most recent seven seasons, the skier visit total fluctuated by as much as 97 percent below and 70 percent above the median. In recent seasons, day visitors have accounted for 65.5 percent of the total, while destination skiers accounted for 34.6 percent of the total.[122] Projections for each alternative are summarized below.

[122] *The Arizona Snowbowl Snow Users Surveys.* Destination skiers are those who stay overnight in the area as part of their trip to the Snowbowl.

Alternative 1 – Increases in average annual visitation would be minor and would only occur in response to projected population increases in the region. Average visits are projected to increase from the current level of 98,000 to 110,500 in 10 years, a net increase of 12,500 visits. However, because Alternative 1 does not include snowmaking, year-to-year visits can be expected to continue to fluctuate dramatically. Based on historic data, total visits are projected to fluctuate plus or minus 70 percent from the average in three of four years. In one of four years, the fluctuation would be more extreme having reached 97 percent below the median. The breakdown between day and destination skiers is not projected to change from the current level.

Alternative 2 – Increases in average annual visitation would be significant and would occur in response to all of the factors listed above, including the addition of a snowtubing facility. The most significant factor by far would be the addition of a snowmaking system. This system would allow the ski area to consistently average 125 days of operation per season and allow the ski area to consistently offer quality ski conditions on a variety of terrain. Based on past operations, an increase in operating days would clearly result in an increase in total annual visitation. Again, operational records make it clear that the number of days of operation is closely related to skier visit totals. Further, the addition of a snowmaking system would increase consumer confidence in the ski area, resulting in an increase in season pass sales and making the ski area more attractive to destination skiers. Average annual visitation is projected to increase from the current level of 98,000 to 214,500 in 10 years: a net increase of 116,500. These incremental visits will represent significant additional travel activity and a positive contribution to the area economy. Year-to-year fluctuations in visits are projected to be far less significant than under alternatives 1 or 3 and are projected to be on the order of plus or minus 15 percent from the average. Destination visitors are expected to increase as a percentage of the total, to 41.5 percent. In addition, it is projected that the snowtubing operation would generate an annual average of 42,000 visits. The great majority of snow-tubers are expected to be day visitors.[123]

Alternative 3 – As documented below under 'Financial Viability,' it is unlikely that the ski area improvements as listed under Alternative 3 would ever be achieved. Because of the lack of snowmaking, the investment required to achieve Alternative 3 would have no reasonable opportunity to be repaid and would, in fact, result in a ski area that is less financially viable than the current condition. As such the 'projected increase' in skier visits under this

[123] Snowtubing would only operate on weekends from Thanksgiving until December 22. At that point, the operation would begin daily operations. It is expected that the facility would operate until the third Sunday in March.

alternative is only a hypothetical that has little chance of every being achieved.

In the unlikely event that Alternative 3 was ever achieved, increases in average annual visitation would be minor, but somewhat higher than those projected for Alternative 1. Increases would occur in response to all of the factors listed above, with the exception of two major factors – the addition of snowmaking capability and the addition of a snowtubing facility. Average visits would be projected to increase from the current level of 98,000 to 117,750 in 10 years, a net increase of 19,750 visits. However, because Alternative 3 does not include snowmaking, year-to-year visits would be expected to fluctuate dramatically. Based on historic data, total visits would be projected to fluctuate plus or minus 70 percent from the average in three of four years. In one of four years, the fluctuation would be more extreme having reached 97 percent below the median in recent years. A small increase in destination skiers would be anticipated in response to the ski area's increased facility offering.

2. *Visitor Spending* – the economic impact of the alternatives would be primarily dependent on increases in spending generated by additional visits to the Arizona Snowbowl. These expenditures would support additional jobs and wages at the ski area as well as additional jobs and wages at other area businesses where Snowbowl visitors make expenditures. Further, these expenditures would create both indirect and induced employment and economic activity in the impact area. Daily, visitor per capita expenditure levels were estimated in five major categories; Eating-Drinking-Entertainment, Retail, Hotel-Lodging, Services, and Lifts-Ski School. Further, breakdowns were developed for day and destination visitors and for spending within the ski area and outside the ski area. It is significant to note that per capita level spending is higher for destination visitors than for day visitors, primarily because of increased spending on Eating-Drinking-Entertainment, Retail and Hotel-Lodging. Further, destination visitors represent a net inflow to the economy – bringing in dollars from outside the local economy.[124] Thus, an alternative that increases the number of destination visitors would be a positive for the Flagstaff area economy.

   Based on the average annual visitation levels of the past seven seasons, total spending by Arizona Snowbowl visitors (including spending inside and outside of the resort) is $9.79 million on an annual basis. Thus, the Snowbowl currently generates almost $10 million in spending in the local economy. This benefits both the Snowbowl and a number of other area businesses where Snowbowl visitors make expenditures.

[124] Per capita spending estimates based on surveys of skier expenditures in several western states including Colorado and Utah and data from *The Arizona Snowbowl Snow Users Surveys.*

3. *Input/Output Analysis* – the projected visitor expenditures were analyzed using an input/output model to project economic impacts to the region. The IMPLAN model was used for making projections regarding prospective employment outside of the resort and employment to be generated on indirect bases.[125] IMPLAN is a broadly accepted model for making projections regarding employment and economic impacts and is commonly used in Environmental Impact Statements prepared as part of the NEPA process.

Employment economic activity creation is defined in three ways in this report, as defined by the IMPLAN model:

Direct – employment created as a direct impact of the project. On-site construction jobs, resort-based jobs and non-resort jobs generated by visitor expenditures are included in this category. The majority of these jobs would be created in the resort or within the greater Flagstaff area.

Secondary – employment created by industry-to-industry spending. For instance, increased food & beverage spending at the Arizona Snowbowl would cause the ski area to purchase more goods from food suppliers. Increased business levels would allow these food suppliers to create more employment. These are *secondary* jobs. These jobs would be created both locally and throughout the geographic area in which construction contractors and the ski area regularly conducts business.

Induced – employment created by increased household spending. The additional jobs and income created by the alternatives and increased visitation would allow consumers to increase their spending on goods and services. This spending would allow a number of businesses to create more jobs. These are *induced* jobs. Induced jobs would be generated over a relatively broad geographic area.

Within this analysis, the combination of *secondary* and *induced* impacts is referred to as *indirect* impacts. It is essential to note that all employment estimates are shown in terms of 'Full-Time-Equivalents,' (FTEs). One FTE is sufficient work to employ on person on a full-time basis for one year. One FTE often represents more than one job position, particularly in situations where many workers are seasonal or employed on a part-time basis.

IMPLAN also provides an 'Output' statistic, the total dollar value of production by all industries.

The IMPLAN model has been constructed to use a geographic area that includes all of Coconino County. The model's output regarding employment impacts considers

[125] IMPLAN Professional is a product of MIG, Inc. and is an economic impact assessment modeling system. IMPLAN allows the user to build economic models to estimate that impacts of economic changes in their states, counties or communities.

economic activity throughout this region.[126] Employment records indicate that a great majority of the Snowbowl's employees live in Coconino County.

The input-output analysis indicates the following regarding Arizona Snowbowl's current economic impact – in terms of FTEs and total output.

Table 3E-12
Current Economic Impact Arizona Snowbowl

	Direct	Indirect	Totals
Employment (FTEs)	189.3	43.1	232
Output ($Millions)	$9.10	$2.98	$12.08

Under current conditions, the Arizona Snowbowl is a clear, positive contributor to the area economy. In total, the Snowbowl is responsible for generating 232 full-time employment equivalents and just over $12 million and annual economic output.

Assumption

This methodology is based on the following assumptions:

- Existing information provides an adequate basis for analysis and disclosure of the socioeconomic impacts of this proposal; no original research was conducted.

- Cost and revenue projections are expressed in 2003 dollars, without adjustment for inflation. Economic impact projections are oriented toward a 'planning year' ten years after the completion of the chosen alternative.

This analysis focuses on the Alpine skiing and snowtubing impacts that are directly associated with the Arizona Snowbowl proposal, leaving qualitative discussion of other forms of recreation to the Recreation section within this document.

Anticipated Impacts

The table on the following page summarizes the analysis presented within the remainder of this section. The data provided represents the anticipated impacts of each alternative estimated at a point ten years following implementation of the respective alternative. Alternative 3 impacts – as shown in the table – are regarded as hypothetical as the analysis has determined that no rational owner or investor would choose to complete this alternative (see 'Financial Viability').

[126] It is possible that the economic impacts of the alternatives would extend beyond Coconino County.

Table 3E-13
Summary of Impacts of Alternatives

		BUILD-OUT PROJECTIONS - 10 Years		
	BASE 2003	**Alt 1 No-Action**	**Alt 2 Proposed Action**	**Alt 3**
Skier Visitation				
Day Skiers	64,234	72,372	125,685	75,012
Destination Skiers	33,908	38,204	89,015	42,705
TOTAL (Annual Average)	**98,142**	**110,576**	**214,700**	**117,716**
Coconino County Demographics				
Population (2002)	125,420		Year 2015 Projection:	158,753
Housing Units (2000)	53,443			
Development Costs ($Millions)				
Spent within impact area	-	$0.75	$15.45	$5.90
Spent outside impact area	-		$4.32	$4.32
TOTAL	**-**	**$0.75**	**$19.77**	**$10.22**
Visitor Spending ($Millions)				
Food & Beverage	$1.7	$1.9	$4.3	$2.1
Retail	$2.7	$3.0	$6.7	$3.3
Hotel & Lodging	$1.3	$1.4	$3.2	$1.6
Services	$0.8	$0.8	$1.9	$0.9
Lifts & Ski School	$3.3	$3.8	$7.7	$4.0
TOTAL	**$9.8**	**$11.0**	**$23.7**	**$11.9**
Employment (FTEs)				
Short-Term (Construction)		(EIS Process Only)		
Direct	-	7	142	50
Secondary	-	2	43	16
Induced	-	2	47	16
Total Construction Employment	-	11	232	82
Long-Term (Expenditures)				
Direct Employment				
On-Site	172	175	211	175
Off-Site	17	38	248	54
Indirect Employment				
Off-Site	43	48	105	52
TOTAL	**232**	**261**	**564**	**282**
Fiscal Considerations				
Forest Service Fees (Average Annual)	$90,000	$99,500	$193,000	$106,000
Property taxes to Coconino County	$36,000	$36,169	$455,833	$245,152
Sales Taxes (County & State)	$257,000	$289,500	$669,000	$308,000

Table data makes it clear that from an economic perspective, Alternative 2's impact would far outweigh either Alternative 1 or 3. As noted, it is highly unlikely that Alternative 3 would ever occur.

Alternative 1 – No Action

Economic Impacts

During previous seasons, Arizona Snowbowl skier visits have shown no regular pattern of increase or decline, as year-to-year totals fluctuate dramatically in response to weather/snow conditions and the number of days the ski area is able to operate in a given year. Market response to the Snowbowl's product is strong when quality skiing conditions exist. This is an indication that an increase in the number of available days of quality skiing would increase skier visit totals. Over the course of the 10 year study period, the *average* annual number of skier visits is expected to increase by 12.7 percent under Alternative 1. However, year-to-year totals would continue to fluctuate dramatically with typical variances in the plus/minus 70 percent range from the average level.

No direct construction would take place under Alternative 1. However, the EIS process would have some economic impact, with total direct spending of $750,000 (refer to Table 3E-20 for a comparison of project related capital expenditures by alternative). The employment and economic output impacts of this spending would be short term and are not expected to last beyond the completion of the process. These FTE and economic output impacts are summarized in the table below.

Table 3E-14
Short-Term Impacts
Alternative 1

	Direct	Indirect	Totals
Employment FTEs)	7.0	4.4	11.4
Output ($Millions)	$0.75	$0.28	$1.03

The EIS process would have the short-term impact of creating over 11 FTEs and $1.03 million in output.

In the longer term, average level increases in annual visitation at the Snowbowl would result in longer term impacts on employment and output. However, it is significant to note that under Alternative 1, these impacts would not be consistent, as year-to-year visitation would continue to fluctuate by a substantial amount. The *average* level of visitor increase at the end of the 10 year planning period, incremental expenditures by Snowbowl visitors over the amount spent in recent years would total $1.19 million. This would include $527,000 in additional spending within the ski area and $664,000 in additional spending outside the ski area – in the remainder of Coconino County.[127] When combined with base level (current) expenditures, spending by Snowbowl visitors would total $10.98 million. While this is not a dramatic increase over the current level of economic input, it does emphasize the Snowbowl's current positive contribution to the economy.

[127] 'Outside' the ski area includes other businesses operated by the Arizona Snowbowl, including lodging and Nordic skiing operations.

Using IMPLAN, the incremental expenditures have been analyzed to determine Alternative 1's incremental impact in terms of direct and indirect employment and output. This is shown in the following table.

Table 3E-15
Long-Term Incremental Impacts
Alternative 1

	Direct	Indirect	Totals
Employment (FTEs)	23.1	5.3	29
Output ($Millions)	$1.11	$0.36	$1.47

At the end of the 10 year planning period, Alternative 1 would generate a total of 29 additional FTEs and $1.47 million in additional economic output within Coconino County. Based on the Snowbowl's estimate of the employment that would be created under Alternative 1 (2.8 FTEs), Alternative 1 would generate 26 FTEs outside of the ski area, in the remainder of Coconino County.

In total (current and incremental), the Arizona Snowbowl would generate 261 FTEs at the completion of the 10 year planning period.

Fiscal Impacts

The No Action alternative could have impacts on payments made by the Arizona Snowbowl to governmental entities, such as the U.S. Government, the State of Arizona, Coconino County and the City of Flagstaff. These fees are used for a variety of public purposes, supporting programs at the Federal, state and local levels.

Forest Service Fees

During recent years, Snowbowl made the following annual payments to Forest Service.

Table 3E-16
Arizona Snowbowl Payments
to Forest Service (1998 – 2002)

Year	Forest Service Fees
1998	$159,715
1999	$24,633
2000	$89,912
2001	$103,875
2002	$24,488
Median	*$89,912*

Fees are collected annually, and are based on skier visitation. The Snowbowl has paid the Forest Service an average of approximately $0.90 per skier visit over the past five seasons. These "Receipt Act" payments are generated from fees paid to National Forests by permittees, such as the Snowbowl, and are distributed pursuant to the Receipt Act. Such payments have historically varied according to the level of revenues generated by the permittee, which in the case of the Snowbowl is directly tied to skier visitation.

Because Snowbowl visitation fluctuates dramatically, Receipt Act payments have varied by a substantial amount – 78 percent over, and 73 percent under, the median of the values shown in the table. A segment of the Forest Service fees are allocated to Coconino County. 75 to 80 percent of this allocation is then used to support local schools. As such, the fees are significant to local education.

Annual fees can be expected to increase as the average skier visit level at the Snowbowl increases. However, skier visit totals under Alternative 1 would continue to fluctuate dramatically, so fees would fluctuate from year-to-year. It is projected that at the end of the 10 year planning period, annual Forest Service fees would average $99,500, with a typical variation range from $30,000 to $169,000.

Sales Tax

The Arizona Snowbowl pays sales taxes to the State of Arizona and Coconino County. Sales taxes support a number of state and local programs and services. The sales tax is essentially based on all Snowbowl revenue, with the exceptions of private ski lessons and labor-based revenue for ski repairs in the rental shop. The table below shows Sales Tax paid by the Snowbowl in recent years.[128]

Table 3E-17
Sales Taxes Paid by Arizona Snowbowl
(1998 – 2003)

	Sales Tax (State & County Combined)
1998	$350,590
1999	$98,991
2000	$311,877
2001	$363,352
2002	$100,079
2003*	$202,493
Cumulative	$1,427,382
Median Annual	***$257,185***

Note: 2003 through April only.
Source: Arizona Snowbowl.

Because sales tax is directly related to revenues, the tax paid by the Snowbowl varies significantly dependent on visitation levels. During the years shown in the table, the tax paid varied from 62 percent below to 41 percent above the median.

Over the years shown, sales tax paid to the state/county averaged approximately $2.60 per skier visit. The potential future increment in sales tax to be paid by the Snowbowl under Alternative 1 is based on the projected average increase in skier visits times this per visit figure. Skier visit totals under Alternative 1 would continue to fluctuate dramatically, so sales tax payments would fluctuate from year-to-year. It is projected that

[128] Note that during the years shown in the table, the Snowbowl made cumulative sales tax payments to the City of Flagstaff in the amount of $14,754 as a result of the Snowbowl's downtown store.

at the end of the 10 year planning period, the *incremental increase* in annual sales tax payments would average $32,500, with a typical variation range from $9,750 to $55,000.

Personal Property Tax

The Arizona Snowbowl pays an annual Personal Property Tax to Coconino County. The tax supports county operations. The tax is based on an assessed value of personal property at the Snowbowl. Property taxes are allocated the county school district, the library and the fire district. As such, they are essential for supporting local programs and services. Because the Snowbowl is on NFS land, the value is based on 'built' facilities or improvements of possessory rights. Recent Personal Property Tax payments to the county are summarized in the table below. [129]

Table 3E-18
Personal Property Tax Payment Made by
Arizona Snowbowl to Coconino County (1998 – 2002)

	Personal Property Tax Payments
1998	$29,266
1999	$37,189
2000	$37,120
2001	$36,367
2002	$36,169

Source: Arizona Snowbowl.

Because Personal Property Tax payments are based on the 'depreciated market' value of built facilities and improvements, they do not fluctuate in response to variation in skier visit totals. The current (2003) 'full value' assessment of the Snowbowl is $1,639,528. [130] The Snowbowl's assessed value is not expected to change under Alternative 1. As such, no significant change in Personal Property Tax payments is anticipated. [131] This is shown in the table below.

Table 3E-19
Estimated Annual Personal Property Payments
Alternative 1

	Current Personal Property Value	Added Value + Under Alternative	Total Estimated Personal Property = Value	Annual Estimated Personal Property Tax
Alternative 1	$1,639,528	$0	$1,639,528	$36,169

[129] Values based on tax payments made by the Snowbowl Alpine ski facility alone and do not include payments for property at the Nordic facility.
[130] Based on 'Personal Property Notice of Value' forms from the Coconino County Assessor's office.
[131] Assessments are based on depreciated value of personal property. As such, the assessment would decrease with time unless improvements are completed.

Alternative 2 – The Proposed Action

Economic Impacts

During previous seasons, Arizona Snowbowl skier visits have shown no regular pattern of increase or decrease, as year-to-year totals fluctuate dramatically in response to weather/snow conditions and the number of days the ski area is able to operate in a given year. Over the 10 year study period, the increase in the *average* annual number of skier visits plus the addition of snowtubing/snowplayer visits under Alternative 2 is expected to increase total visitation at the Snowbowl by 162 percent over current annual average visitation and 132 percent over the existing condition. In addition, fluctuation in year-to-year totals would decrease dramatically because of the addition of a snowmaking system. Year-to-year fluctuation is expected to be plus or minus 15 percent from average annual visitation.

As detailed in Table 3E-20, substantial direct construction would take place under Alternative 2. The total construction value of Alternative 2 improvements is estimated at $19,773,000, of which approximately $15,453,000 would be primarily local spending.[132]

Table 3E- 20
Project Capital Expenditures by Alternative[a]

	Alternative 1	Alternative 2	Alternative 3
Snowmaking Infrastructure	n/a	$8,200,000	n/a
Snowplay – Terrain	n/a	$350,000	n/a
Snowplay – Parking	n/a	$300,000	n/a
Snowplay – Facility	n/a	$700,000	n/a
Lifts – Local Construction	n/a	$1,080,000	$1,080,000
Lifts – Non-Local Equipment	n/a	$4,320,000	$4,320,000
Terrain Improvements	n/a	$558,000	$558,000
Guest Service facilities – All	n/a	$2,800,000	$2,800,000
Summer Trails	n/a	$65,000	$65,000
Infrastructure – Sewer	n/a	$350,000	$350,000
Infrastructure – Roads/Underpass	n/a	$200,000	$200,000
Parking, Roads	n/a	$100,000	$100,000
Entitlements	$750,000	$750,000	$750,000
Total for Alternative	**$750,000**	**$19,773,000**	**$10,223,000**

Source: Arizona Snowbowl Management, Landvest, Sno.matic Controls & Engineering, SE GROUP
[a] Recurring capital expenditures for maintenance are not included here, but are discussed elsewhere within this section.

The employment and economic output impacts of this construction spending would be significant, but would be short-term and are not expected to last beyond the completion

[132] Approximately $4,320,000 would be expended on equipment (primarily ski lifts) that would be manufactured outside of the Coconino County study area.

of the construction activity. The FTE and economic output impacts of Alternative 2 construction are summarized in the table below.

Table 3E-21
Short-Term Impacts
Alternative 2-The Proposed Action

	Direct	Indirect	Totals
Employment FTEs)	142.0	89.6	231.6
Output ($Millions)	$15.10	$6.14	$21.24

Alternative 2 construction activity would have the short-term impact of creating over 230 FTEs and generating $21.24 million in economic output. While short-term in nature, this would represent a significant number of construction related jobs and economic activity.

In the longer term, average level increases in visitation at the Snowbowl would result in long term impacts on employment and output. These impacts would be relatively consistent under Alternative 2, as visitation at the Snowbowl would not fluctuate significantly due to the introduction of a snowmaking system. In addition, the long-term viability of the Snowbowl would be enhanced under this alternative. At the average level of annual visitor increase at the end of the 10 year planning period, incremental expenditures by Snowbowl visitors over the amount spent in recent years would total $14.00 million. This would include $5.66 million in additional spending within the ski area and $8.30 million in additional spending outside the ski area – in the remainder of Coconino County.

When combined with base level (current) expenditures, spending by Snowbowl visitors would total $23.74 million. This would be a significant positive impact to the area economy, giving a boost to both the Snowbowl and a significant number of other businesses that would draw expenditures from Snowbowl visitors. Most significantly, these expenditures would support additional local employment, as detailed below.

Using IMPLAN, the incremental expenditures have been analyzed to determine Alternative 2's incremental impact in terms of direct and indirect employment and output. This is shown in the table below.

Table 3E-22
Long-Term Incremental Impacts
Alternative 2-The Proposed Action

	Direct	Indirect	Totals
Employment (FTEs)	269.6	61.6	331
Output ($Millions)	$12.97	$4.26	$17.23

At the end of the 10 year planning period, The Proposed Action would generate a total of 332 additional FTEs and $17.23 million in additional economic output in Coconino County. Respectively, these exceed the effects of the No Action Alternative by 303 FTEs and $15.76 million in economic output. Based on the estimate of the employment that would be created under Alternative 1 (38.9 FTEs), Alternative 2 would generate 292 FTEs outside of the ski area, in the remainder of Coconino County.

In total (current and incremental), the Arizona Snowbowl would generate 564 FTEs at the completion of the 10 year planning period. While the Snowbowl would still not be the major drive of the Flagstaff area economy, the importance of 564 full-time equivalent jobs is difficult to overstate.

Fiscal Impacts

Alternative 2 could have impacts on payments made by the Arizona Snowbowl to governmental entities, such as the U.S. Government, the State of Arizona, Coconino County and the City of Flagstaff.

Forest Service Fees

Annual payments to the Forest Service in recent years are shown under Alternative 1 above.

Fees are collected annually, and are based on skier visitation. The Snowbowl has paid the Forest Service an average of approximately $0.90 per skier visit over the past five seasons. These "Receipt Act" payments are generated from fees paid to National Forests by permittees, such as the Snowbowl, and are distributed pursuant to the Receipt Act. Such payments have historically varied according to the level of revenues generated by the permittee, which in the case of the Snowbowl is directly tied to skier visitation. Because Snowbowl visitation fluctuates dramatically, Receipt Act payments have varied by a substantial amount – 78 percent over and 73 percent under the median of the values shown in the table. A segment of the Forest Service fees are allocated to Coconino County. 75 to 80 percent of this allocation is then used to support local schools. As such, the fees are significant to local education.

Annual fees can be expected to increase as the average skier visit level at the Snowbowl increases. Total annual visitation (skiers and snowplayers) would be relatively consistent under Alternative 2, as a result of the introduction of a snowmaking system. As a result, fees can be expected to be relatively steady from year-to-year – only fluctuating within a range of 15 percent plus or minus. It is projected that at the end of the 10 year planning period, annual Forest Service fees would average $193,000, with a typical variation range from $164,000 to $222,000. Average annual fees generated by Alternative 2 would exceed those to be generated by the No Action Alternative by approximately $93,500 and would be consistent from year-to-year. The incremental increase in fees is significant in two ways: 1) it will provide additional funding for programs; and 2) because the fee level will be consistent, will provide stability in program funding.

Sales Tax

The Arizona Snowbowl pays sales taxes to the State of Arizona and Coconino County. The tax supports a number of state and local programs and services. The sales tax is essentially based on all Snowbowl revenue, with the exceptions of private ski lessons and labor-based revenue for ski repairs in the rental shop. Sales taxes paid by the Arizona Snowbowl in recent years are shown under Alternative 1 above. Because sales tax is directly related to revenues, the tax paid by the Snowbowl varies significantly dependent on visitation levels. During the years shown in the table, the tax paid varied from 62 percent below to 41 percent above the median.

Over the years shown, sales tax paid to the state/county averaged approximately $2.60 per skier visit. The potential future increment in sales tax to be paid by the Snowbowl under Alternative 2 is based on the projected average increase in skier visits times this per visit figure. Skier visit totals under Alternative 2 would be relatively consistent as a result of the introduction of a snowmaking system, so sales tax payments would not change significantly from year-to-year. It is projected that at the end of the 10 year planning period, the *incremental increase* in annual sales tax payments would average $412,000, with a typical variation range from $350,000 to $474,000. The incremental increase in sales taxes under Alternative 2 exceeds the incremental increase under the No Action alternative by $380,000 on an annual basis. In total (current plus projected sales tax), it is projected that if Alternative 2 were to be accomplished, the Arizona Snowbowl would generate $650,000 in sales tax on an annual basis. This is a substantial to programs and services funded by the sales tax.

Personal Property Tax

The Arizona Snowbowl pays an annual Personal Property Tax to Coconino County. Property taxes are allocated the county school district, the library and the fire district. As such, they are essential for supporting local programs and services. The tax is based on an assessed value of personal property at the Snowbowl. Because the Snowbowl is on NFS land, the value is based on 'built' facilities or improvements of possessory rights. Recent Personal Property Tax payments to the county are summarized under Alternative 1 above. The tax supports a number of county programs and services.

Because Personal Property Tax payments are based on the 'depreciated market' value of built facilities and improvements they do not fluctuate in response to variation in skier visit totals. The current (2003) 'full value' assessment of the Snowbowl is $1,639,528.[133] The Snowbowl's assessed value would increase substantially under Alternative 2, as a number of new facilities and improvements would be made under the alternative's construction program. In total, the construction program calls for $19.023 million in new facilities and improvements at the Arizona Snowbowl.[134] As such, annual personal property tax payments would increase substantially. This is shown in the table below.

Table 3E-23
Estimated Annual Personal Property Tax Payments
Alternative 2

	Current Personal Property Value	Added Value + Under Alternative	Total Estimated Personal Property = Value	Annual Estimated Personal Property Tax
Alternative 2	$1,639,528	$19,023,000	$20,662,528	$455,833

It is estimated that upon completion Alternative 2 would generate over $450,000 annually in Personal Property Tax payments. This is an increment of $420,000 annually over the

[133] Based on 'Personal Property Notice of Value' forms from the Coconino County Assessor's office.
[134] This figure includes the value of ski lifts that would be manufactured outside the study area but does not include the cost of the EIS process.

current level (Alternative 1) and would be a significant source of support for county programs and services.

Alternative 3

It is the conclusion of the analysis that Alternative 3 is highly unlikely to be fully implemented, either by the current or a future owner. This is documented below under 'Financial Viability of the Ski Area.' Alternative 3 would include significant improvements to ski facilities, but the alternative does not include snowmaking. As such, skier visits and thus revenues would continue to fluctuate dramatically. With a higher break-even resulting from the investment in Alternative 3 improvements, the ski area would be unprofitable a high percentage of the time. Given these circumstances, a rational owner/investor would not fully implement Alternative 3. At most, an owner/investor might make several of the minor improvements included in the alternative; these improvements would have little or no impact on skier visitation and ski area economic impact. In the event that an owner/investor did complete Alternative 3, the ski area would be placed in a highly tenuous financial situation which could potentially lead to the cessation of operations within several years. In that event, the Snowbowl's current positive economic benefits would be lost.

Viewed from a realistic perspective, Alternative 3 can be viewed as virtually the same as Alternative 1; if Alternative 3 were to be approved, essentially no change would take place at the Snowbowl.

The analysis of Alternative 3 economic and fiscal impacts below should thus be regarded as hypothetical in nature as the analysis concludes that a rational investor would not complete these improvements. In the unlikely event that the alternative were fully implemented, the impacts may only last for a few years, as financial losses could eventually force the ski area to cease operations.

Economic Impacts

During previous seasons, Arizona Snowbowl skier visits have shown no regular pattern of increase or decline, as year-to-year totals fluctuate dramatically in response to weather/snow conditions and the number of days the ski area is able to operate in a given year. In the unlikely event that Alternative 3 was to be accomplished, the *average* annual number of skier visits is expected to increase by 19.9 percent over current average annual visitation and 6.5 percent over Alternative 1 over the 10 year planning period. Year-to-year totals would continue to fluctuate dramatically with typical variances in the plus/minus 70 percent range from the average level. Again, it is unlikely that these changes would ever occur.

Significant direct construction would take place under Alternative 3, if it were to be accomplished. The total construction value of Alternative 3 improvements is estimated at $10,223,000, of which approximately $5,903,000 would be primarily local spending.[135] The employment and economic output impacts of this construction spending would be significant, but would be short-term and would not be expected to last beyond the

[135] Approximately $4,320,000 would be expended on equipment (primarily ski lifts) that would be manufactured outside of the Coconino County study area.

completion of the construction activity. The FTE and economic output impacts of Alternative 3 construction are summarized in the table below.

Table 3E-24
Short-Term Impacts
Alternative 3

	Direct	Indirect	Totals
Employment FTEs)	50.2	32.1	82.3
Output ($Millions)	$5.55	$2.20	$7.75

Alternative 3 construction would have the short-term impact of creating over 80 FTEs and generating $7.75 million in economic output. However, it is unlikely that a rational investor would undertake all of these projects.

In the hypothetical instance in which the Alternative 3 projects were to be completed, average increases in annual visitation at the Snowbowl would result in impacts on employment and output. However, these impacts would likely only occur until the ski area ceased operations – a likely outcome if Alternative 3 were to be fully implemented. Further, under Alternative 3, these impacts would not be consistent, as year-to-year visitation would continue to fluctuate by a substantial amount. At the *average annual* level of visitor increase at the end of the 10 year planning period, incremental expenditures by Snowbowl visitors over the amount spent in recent years would total $2.09 million. This would include $0.84 million in additional spending within the ski area and $1.25 million in additional spending outside the ski area – in the remainder of Coconino County. [136] When combined with base level (current) expenditures, spending by Snowbowl visitors would total $11.88 million. Again, it is unlikely that this would ever occur.

Using IMPLAN, the hypothetical incremental expenditures were analyzed to determine Alternative 3's incremental impact in terms of direct and indirect employment and output. This is shown in the table below.

Table 3E-25
Long-Term Incremental Impacts
Alternative 3

	Direct	Indirect	Totals
Employment (FTEs)	40.2	9.2	50
Output ($Millions)	$1.94	$0.64	$2.58

At the end of the 10 year planning period, Alternative 3 would generate a total of 50 additional FTEs and $2.58 million in additional economic output in Coconino County. Respectively, these exceed the impacts of the No Action Alternative by 21 FTEs and $1.11 million in economic output. Based on the estimate of the employment that would be created under Alternative 3 (3.5 FTEs), Alternative 3 would generate 46 FTEs outside

[136] 'Outside' the ski area includes other businesses operated by the Arizona Snowbowl, including lodging and Nordic skiing operations.

of the ski area, in the remainder of Coconino County. Realistically, these impacts are unlikely to occur.

Fiscal Impacts

In the unlikely event that it were to be accomplished, Alternative 3 could have impacts on payments made by the Arizona Snowbowl to governmental entities, such as the U.S. Government, the State of Arizona, Coconino County and the City of Flagstaff.

The analyses below assess the hypothetical instance in which Alternative 3 projects were to be fully accomplished. This situation is highly unlikely and, if it were to occur, could result in the cessation of business activity by the ski area.

Forest Service Fees

Annual payments to the Forest Service in recent years are shown under Alternative 1 above.

Fees are collected annually, and are based on skier visitation. The Snowbowl has paid the Forest Service an average of approximately $0.90 per skier visit over the past five seasons. These "Receipt Act" payments are generated from fees paid to National Forests by permittees, such as the Snowbowl, and are distributed pursuant to the Receipt Act. Such payments have historically varied according to the level of revenues generated by the permittee, which in the case of the Snowbowl is directly tied to skier visitation. Because Snowbowl visitation fluctuates dramatically, Receipt Act payments have varied by a substantial amount – 78 percent over and 73 percent under the median of the values shown in the table.

Annual fees would be expected to increase as the average skier visit level at the Snowbowl increases. However, in the unlikely event that the alternative was to be accomplished, annual skier visit totals under Alternative 3 would continue to fluctuate dramatically, so fees would fluctuate from year-to-year. It is projected that at the end of the 10 year planning period, annual Forest Service fees would average $106,000, with a typical variation range from $32,000 to $180,000.

Sales Tax

The Arizona Snowbowl pays sales taxes to the State of Arizona and Coconino County. The sales tax is essentially based on all Snowbowl revenue, with the exceptions of private ski lessons and labor-based revenue for ski repairs in the rental shop. Sales taxes paid by the Arizona Snowbowl in recent years are shown under Alternative 1 above. Because sales tax is directly related to revenues, the tax paid by the Snowbowl varies significantly dependent on visitation levels. During the years shown in the table, the tax paid varied from 62 percent below to 41 percent above the median.

Over the years shown, sales tax paid to the state/county averaged approximately $2.60 per skier visit. The potential future increment in sales tax to be paid by the Snowbowl under Alternative 3 – in the unlikely even that it was to be accomplished - is based on the projected average increase in skier visits times this per visit figure. Annual skier visit totals under Alternative 3 would continue to fluctuate dramatically, so sales tax payments

would fluctuate from year-to-year. It is projected that at the end of the 10 year planning period, the *increment* in annual sales tax payments would average $51,000, with a typical variation range from $15,250 to $86,500. The incremental increase in sales taxes under Alternative 3 would exceed the increment under the No Action Alternative by $18,500 on an annual basis.

Personal Property Tax

The Arizona Snowbowl pays an annual Personal Property Tax to Coconino County. The tax supports county operations. The tax is based on an assessed value of personal property at the Snowbowl. Because the Snowbowl is on NFS land, the value is based on 'built' facilities or improvements of possessory rights. Recent Personal Property Tax payments to the county are summarized under Alternative 1 above.

Because Personal Property Tax payments are based on the 'depreciated market' value of built facilities and improvements, they do not fluctuate in response to variation in annual skier visit totals. The current (2003) 'full value' assessment of the Snowbowl is $1,639,528.[137] The Snowbowl's assessed value would increase if Alternative 3 were to be accomplished, as a number of new facilities and improvements would be made under the alternative's construction program. In total, the construction program calls for $9.473 million in new facilities and improvements at the Arizona Snowbowl.[138] As such, annual personal property tax payments would increase substantially. This is shown in the table below.

Table 3E-26
Estimated Annual Personal Property Payments
Alternative 3

	Current Personal Property Value	Added Value + Under Alternative	Total Estimated Personal Property = Value	Annual Estimated Personal Property Tax
Alternative 3	$1,639,528	$9,473,000	$11,112,528	$245,152

Indicator:

Financial Viability of the Ski Area Under All Alternatives

During the most recent eleven ski seasons (1992/93 to 2002/03) the Arizona Snowbowl's business record has been inconsistent; in seven years, revenues have exceeded costs of operation and the ski area has been profitable. However, in the remaining four seasons, costs have exceeded revenues and the business has lost money. Common sense says that any business that loses money during 36 percent of its operational periods would be regarded as a one of marginal viability. Further, the Snowbowl is in a capital-intensive business, one where capital expenditures are required on a regular basis to offer a quality product, offer an adequate level of guest service and to maintain a reasonable level of competitiveness. Over the past eleven operating years, the Snowbowl has invested a cumulative total of $4.42 million in capital expenditures, all of which has been oriented

[137] Based on 'Personal Property Notice of Value' forms from the Coconino County Assessor's office.
[138] This figure includes the value of ski lifts that would be manufactured outside the study area but does not include the cost of the EIS process.

toward ski area maintenance.[139] These expenditures have merely served to maintain the Snowbowl's existing competitive situation. In the ski industry, it is generally assumed that at least six percent of gross revenues should be allocated for maintenance capital – capital expenditures sufficient to maintain a ski area at an acceptable level of quality, but not to make significant improvements to the facility. The Snowbowl's capital investment over the past eleven years has equaled 8.87 percent of gross revenues.[140] However, as shown below, this level has expenditure has required the ski area's owners to infuse additional capital as these expenditures have exceeded net revenues. Alternative 2 envisions significant additional capital expenditures, with the intent of improving the offerings and quality of the ski area and, most significantly, allowing the ski area to provide a more consistent operation from year-to-year. While Alternative 3 includes ski area enhancements, it is significantly constrained by a continued reliance upon natural snowfall and is highly unlikely to ever be fully accomplished.

The Snowbowl is dependent on skier visits – and skier expenditures – to generate revenues.[141] As such, the revenue stream is directly related to skier visits from season-to-season. The ski industry is sensitive to weather conditions (snow) and the presence or absence of quality ski conditions. Because the industry is so dependent on the presence of snow, 82 percent of U.S. ski areas have installed snowmaking systems.[142] Snowmaking systems allow ski areas to open earlier in the season and remain consistently open through the length of the season. Just as significantly, snowmaking allows ski areas to offer a quality skiing product during periods when there is no natural snow or when weather conditions would otherwise result in poor skiing conditions or a ski area closing. With no snowmaking system, the Arizona Snowbowl is entirely dependent on the weather and the presence of natural snowfall. Although the climate data presented in Soils Section I details that temperatures are adequate for snowmaking application, natural snowfall at the Snowbowl is highly variable. The graphic below shows total snowfall at the Snowbowl during the past 22 seasons.

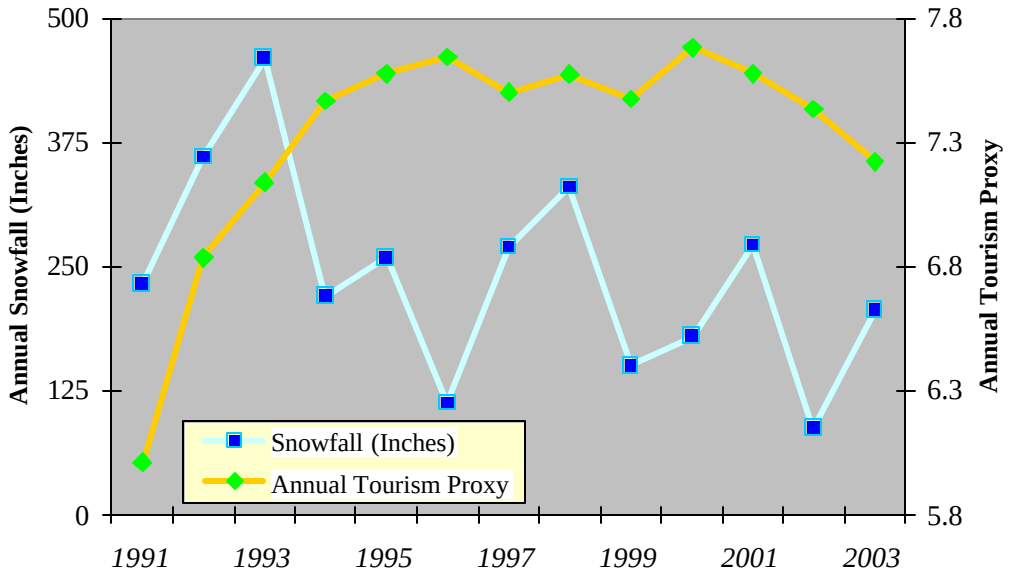
[139] The Snowbowl's capital expenditures have been oriented toward maintenance of the current level of quality, including items such as restrooms, groomers, water trucks, and background infrastructure. Capital investment has not been sufficient to add improvements that would be evident to the skier, such as new lifts, lodge space, terrain, etc.

[140] 11 year Gross Revenues - $49.78 million. 11 Year Capital Expenditures - $4.42 million. 8.87 percent of Gross Revenues. Source: Arizona Snowbowl Controllers Office.

[141] The Snowbowl also operates a Sky Ride business during the summer months.

[142] Based on respondents to NSAA annual survey 2002/03. Typically, ski areas that do not have snowmaking fall into two categories: 1) Ski areas with locations that enjoy plentiful and consistent natural snow and; 2) Small ski areas (average less than 20,000 skier visits) that do not have the financial resources to install snowmaking.

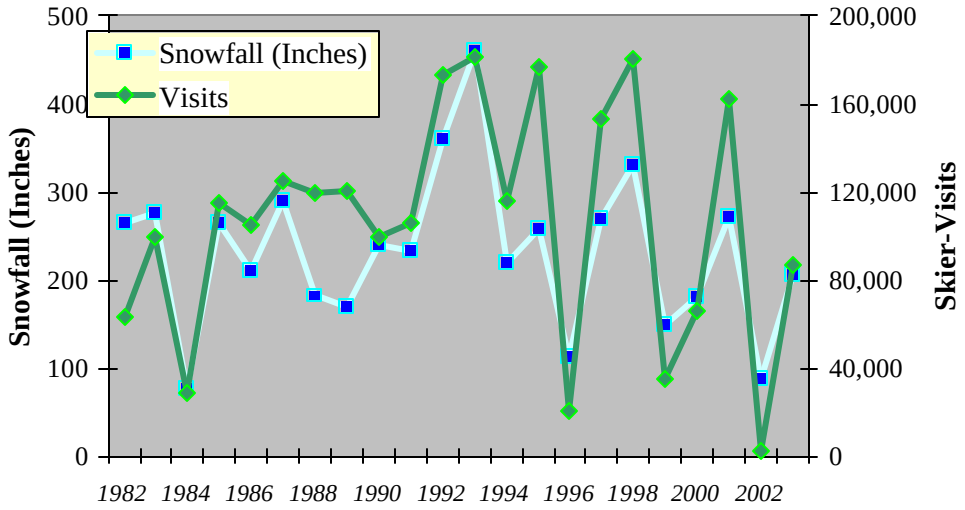
Figure 3E-1
Natural Snowfall at Arizona Snowbowl (1981/82 – 2002/03)



During the 22 seasons shown in the graphic, the Snowbowl's median snowfall was 236 inches. However, snowfall in individual seasons ranged from 68 percent below the median (76 inches) to 95 percent above the median (460 inches). Significantly, median snowfall during the most recent five seasons – at 180 inches – has fallen well below the longer term median.

The Snowbowl's dependency on natural snowfall to generate skier visits is clearly shown in the following graphic, which compares variation in natural snowfall with variation in skier visits.

Figure 3E-2
Comparison of Natural Snowfall and Skier visits at Arizona Snowbowl (1981/82 – 2002/03)

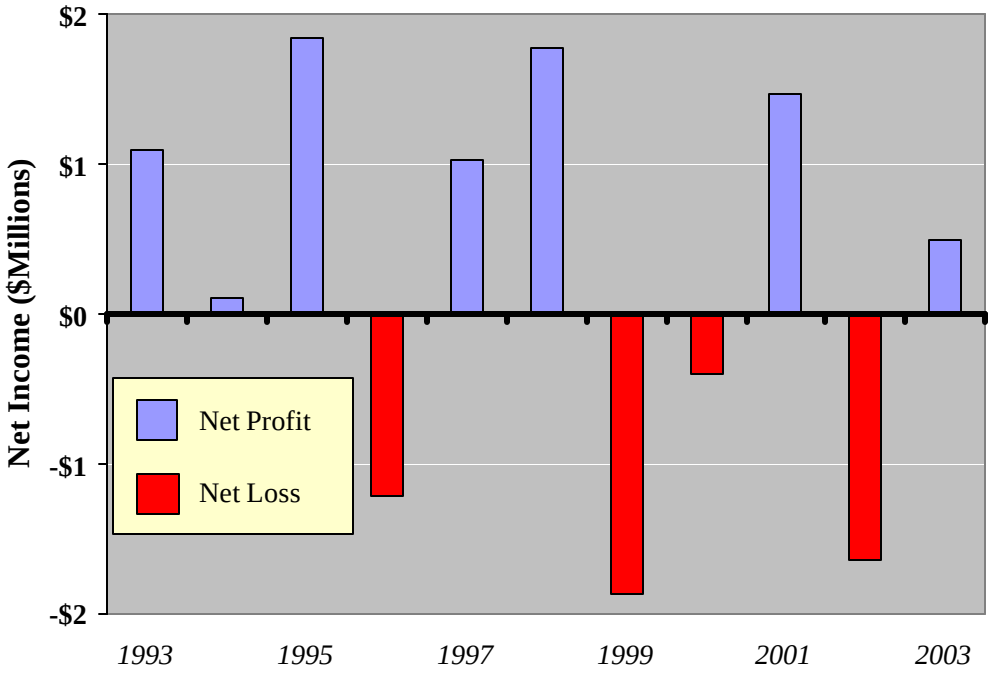


It is apparent that up and down variation in snowfall results in similar variation in skier visits. The effect has been even more significant in the past 11 seasons, with above average snowfall resulting in well above average visits and below average snowfall resulting in well below average visits. In conclusion, the Snowbowl is highly dependent on natural snowfall to deliver skier visits and associated revenues. During the past decade, natural snowfall has fallen below the longer term median 60 percent of the time.

The impact of this skier visit variation on the Arizona Snowbowl as a for-profit business is shown in the graphic below. The graphic shows the Snowbowl's fiscal year net income over the past 11 seasons, as it has varied above and below the 'break-even' point.[143]

[143] Source: Arizona Snowbowl Controller's Office. Net Income defined as total revenue from skiing operation less Cost of Sales, Expenses-Selling, G&A and Interest. Break-even point is the point where revenues equal costs.

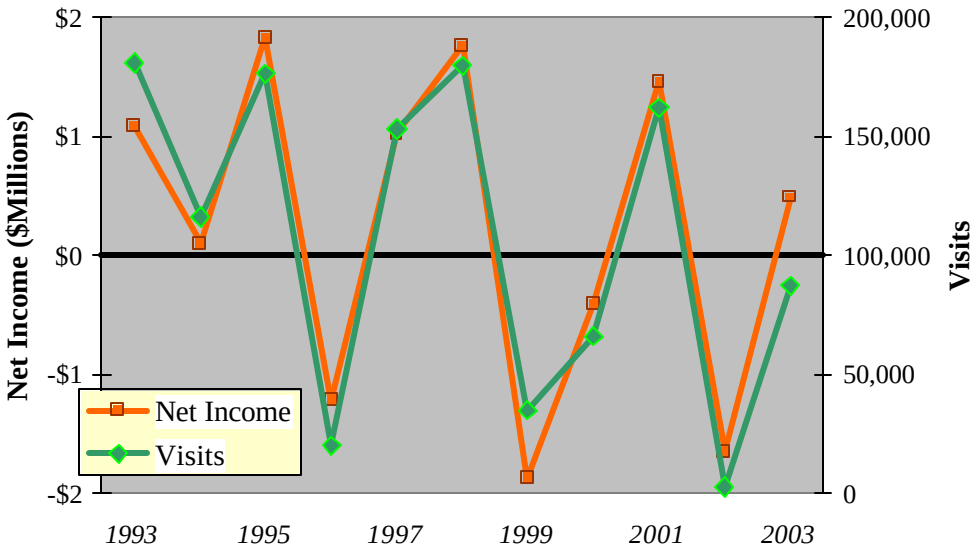
Figure 3E-3
Net Profit Season to Season
Arizona Snowbowl (1992/93 – 2002/03)



During the past 11 seasons, the Snowbowl experienced a net profit in seven years and a net loss in four years. Over the 11 year period, the cumulative net income of the ski area was $2.65 million. However, as noted above, during the same period the Snowbowl has made a total capital investment of $4.42 million, simply to maintain existing facilities and retain a consistent level of facility quality. Ski areas routinely need to invest six percent or more of gross revenues back into their facility simply for maintenance purposes. While the Snowbowl owners have been willing to infuse additional capital over the past 11 years for maintenance and quality purposes, it is apparent that the differential between net income and minimum required capital investment has been a losing proposition, resulting in a net loss of $1.77 million over the period. It is unlikely that the owner of any business would continue to operate on this basis over an extended period of time.

The extremely close relationship between skier visits and net income is shown in the graphic below.

Figure 3E-4
Comparison of Skier visits and Net Profit
Arizona Snowbowl (1992/93 – 2002/03)



Given the variability of snowfall at the ski area, the pattern of net profit/loss can be expected to continue for the foreseeable future, unless steps are taken to mitigate the impact of natural snowfall variability. Further, the pattern of profit and loss makes it difficult for owners to continue to provide the required capital (six percent of gross revenues) to maintain the facility. During the past 11 operating seasons, invested capital has exceeded the ski area's net profits.

Business owners may apply a variety of criteria in making decisions regarding the viability of an existing or potential business; Profit/Loss, Return on Investment, Internal Rate of Return, Tax Implications may all come into play. However, at the most basic level, the viability of any for-profit business rests on its ability to make a profit from year-to-year. The Arizona Snowbowl's record over the past 11 operating seasons shows a loss in four years, or 36 percent of the time. Further, it is clear that these losses are closely associated with significant variation in skier visits, a factor of inconsistent snowfall and skiing conditions. For most potential business owners, the prospect of owning a business that is likely to operate at a loss in four of 11 years would not be attractive. Just as significantly, current business owners are unlikely to continue to operate a business that often shows a loss, particularly when maintenance of the physical plant has required them to infuse 'out-of-pocket' capital.

The analysis clearly indicates that the full implementation of Alternative 3 is not viable from a financial perspective and that a rational owner/investor would be highly unlikely to undertake completion of the alternative. While the alternative includes ski area improvements, the lack of reliable snowfall would continue to subject the ski area to inconsistent operations and skier visit totals that would vary dramatically from year-to-year. Significantly, the ski area's break-even point (the point at which revenues from

skier visits equal operational and debt costs) would increase due to the investment in the Alternative 3 improvements. Because average annual skier visits would not increase by a substantial amount, the ski area would experience a financial loss in a higher percentage of its operating seasons. Given this reality, an owner/investor would not likely undertake substantial improvements – unless they include snowmaking.

In summary:

- The Arizona Snowbowl is in a tenuous business position and would continue to be so under Alternative 1. With net income in the negative range for a significant percentage of its operating seasons, and minimal required capital investment exceeding cash flow, it is not reasonable to expect that the business will continue to operate unless improvements are made to generate more consistent skier visits or by substantially reducing the current level of maintenance and operational expenditures. The Snowbowl's record indicates that it is capable of operating profitably when there are sufficient skier visits. However, one major factor beyond the Snowbowl's control – inconsistent natural snowfall – results in unprofitable operations in an unacceptably high percentage of its operating seasons.

- Alternative 2 would improve the ski area's financial viability, make it a more attractive investment and help to ensure that the facility's positive economic contribution is enhanced and maintained.

- A rational investor would not undertake the improvements included within Alternative 3. Thus, the outcome of this alternative is effectively similar to that for Alternative 1. In the unlikely event that the Alternative was to be accomplished, the ski area would be placed in severe financial peril with the potential to cease business operations within several years.

Alternative 1 – No Action

Alternative 1 would result in no significant change in the Snowbowl's viability as a for-profit business. While average annual skier visits are projected to increase by 12.7 percent over the current level, season-to-season totals would continue to fluctuate dramatically. As such, it is reasonable to project that under Alternative 1, the ski area would continue to experience negative net income in 30 to 40 percent of its operating seasons. Thus, the viability of the ski area would remain tenuous.

In the event that the ski area continued to operate, it is unlikely that owners would continue to provide capital investment at the minimum required six percent of gross revenues, as this has required investment in excess of net profit in the past. Rather, it is likely that owners would revert to a lower investment level and that the ski area would offer a decreased level of services and/or a lower quality experience.

Alternative 2 – The Proposed Action

Alternative 2-The Proposed Action would result in a significantly altered business environment for the Arizona Snowbowl as a result of several major factors:

1. The alternative would result in a dramatic increase in average annual skier visits over the current level. Skier visits are projected to increase by 119 percent under this alternative.

2. The skier visit total would be consistent under this alternative in contrast with current operating conditions. The addition of a snowmaking system would allow the ski area to consistently operate for 125 days per season. It is projected that season-to-season total skier visits would only vary by plus or minus 15 percent from the average.

3. Significant improvements to the skiing facility and the addition of a snowplay/snowtubing facility along with more consistent operations would result in greater season pass sales and attract a higher percentage of destination skiers. Destination skiers typically spend more per capita than do day visitors. Further, the Snowbowl would become more competitive in the Arizona market.

4. A higher and more consistent level of ski area revenues would make it possible for owners to continue to invest at least the minimum six percent of gross revenues to maintain the physical facilities and maintain quality levels.

For the business owner, the prospect of consistent business operations would be the most attractive outcome of Alternative 2. Under this alternative, annual skier visit totals are only expected to vary from the average by plus or minus 15 percent. While the investment required to achieve Alternative 2 is substantial and would result in a higher break-even point (more skier visits required to achieve profitable operations), year-to-year variations in business levels would be minimalized and would result in positive net income in a higher percentage of seasons than under current operating conditions. The Ski Area would be in a significantly better financial position from which to maintain the physical facilities and maintain quality levels.

The viability of the Arizona Snowbowl as a for-profit business would be enhanced under this alternative. Further, Alternative 2 would result in the ski area becoming a more attractive investment, both for current or prospective owners. Again, this would improve the facility's longer term viability as a generator of winter-based economic activity in the Flagstaff area.

Alternative 3

Because a rational owner/investor would be unlikely to fully undertake Alternative 3, the ski area's continuing financial viability would effectively be similar to that for Alternative 1 - no significant change in the Snowbowl's viability as a for-profit business. The viability of the ski area would remain tenuous.

In the unlikely event that Alternative 3 was to be accomplished, the viability of the Arizona Snowbowl as a for-profit business would decrease. Two major factors would result in decreased viability:

1. While average annual level skier visits would be projected to increase by 19.9 percent over the current level, season-to-season totals would continue to fluctuate dramatically. It is reasonable to project that visitor totals in a significant percentage of seasons would continue to fall below the current break-even point.

2. The substantial investment called for under Alternative 3 would result in a higher break-even point for year-to-year operations. Thus, the percentage of seasons in which operations would fall under the break-even point could increase.

A prudent business operator would not make the majority of the investments in Alternative 3, as the break-even point for profitable operations would increase while skier visit totals would continue to fluctuate dramatically. The viability of the ski area would decline significantly.

In the event that the ski area continued to operate, it is unlikely that owners would continue to provide capital investment at the minimum required six percent of gross revenues, as this has required investment in excess of net profit in the past. Rather, it is likely that owners would revert to a lower investment level and that the ski area would offer a decreased level of services and/or a lower quality experience.

Indicator:

Narrative Description of the Recreational/Social Function Which Snowbowl Serves

The Arizona Snowbowl serves a variety of recreational and social functions in the Flagstaff area. A summary of these functions follows:

- The Snowbowl is the primary facility for winter sports recreation in the greater Flagstaff area. With a location that is easy to access from the center of Flagstaff, the Snowbowl provides an outlet for winter recreation to the population of the entire region. It is significant to note that the Snowbowl is the only ski area in the Flagstaff area – the next closest ski area (Sunrise Park Resort) is more than 125 miles from Flagstaff. The Snowbowl is also the most accessible ski area for residents of the Phoenix metro area.

- As the only ski area in the Flagstaff area, the Snowbowl provides the regional population with its only facility for Alpine skiing, snowboarding and – at the Nordic center – for Nordic skiing.

- The Snowbowl hosts and supports the Flagstaff Ski Club that provides a facility and training for Alpine and snowboard training and competition.

- The Snowbowl also provides a recreational outlet for those who are not involved in Alpine or Nordic skiing. Hiking trails and the Sky Ride provide a way for non-skiers

to get into the mountains and enjoy the mountain environment. The Sky Ride is significant, as many persons are not physically capable of hiking into the mountains. The Sky Ride provides a means to get direct access to this environment for those who cannot hike or ski.

- The Snowbowl provides one of the few true winter recreation attractions in the greater Flagstaff area. In addition to boosting winter visitation in the area, the facility provides Flagstaff with a recreational offering that is unusual in Arizona.

- The Snowbowl also is significant to the Flagstaff community from a social perspective:

  - The Snowbowl assists over 200 area organizations with fundraising efforts – primarily with lift ticket donations.
  - The Snowbowl hosts several large fundraisers and other major events, including: the Climb a Mountain to Conquer Cancer; the Huega Ski Express; Grand Canyon State Winter Games; the Special Olympics; Wine Fests; 5th Grade Learn to Ski; and others.
  - Local contributions: the Snowbowl recently donated ski tickets with a value of $30,000 to local public schools because of budget shortfalls.

- The Snowbowl holds memberships in a number of civic organizations and contributes to their causes. These include: Flagstaff Chamber of Commerce, Flagstaff Convention and Visitor Bureau.

- The Snowbowl supports over 25 programs at Northern Arizona University and assists with its educational goals by participating in a number of surveys and business studies.

- The Snowbowl makes a measurable contribution to the area economy by virtue of the expenditures made by ski area visitors. These contributions are summarized under 'Economic Indicators' above.

In summary, the Snowbowl is a unique facility – a winter recreation center in a state that is far better known for warm weather offerings – providing the only outlet for Alpine and Nordic activity in the region.

Alternative 1 – No Action

Alternative 1 would not result in a significant change to the Snowbowl's recreational and social functions as summarized above. However, as detailed under 'Financial Viability of the Ski Area,' the continuation of the current operation as a for-profit business may not be sustainable; the ski area would likely decrease expenditures on maintenance and non-essential services leading to an overall reduction in the quality of the services offered under Alternative 1. In this event, much of the social and economic functions summarized above may be reduced or lost. Perhaps most importantly, the quality of the most significant Alpine recreation venue within the Flagstaff area would be greatly diminished.

Alternative 2 – The Proposed Action

The recreational and social functions of the Snowbowl would be enhanced under Alternative 2. These enhancements are summarized below:

- The addition of a snowtubing/snowplay area would make the Snowbowl an accessible winter recreation venue for non-skiers. Snowtubing and snowplay require no experience or expertise and would allow persons who would otherwise not be involved in winter recreation to become involved.

- Annual visitation and thus visitor expenditures would be substantially increased under this alternative. As such, the Snowbowl's contribution to the area economy would increase.

- Because the Snowbowl's business volume would become more consistent under this option, the Snowbowl would have the capability to make more consistent contributions to area organizations, to more consistently host special events at the ski area and to commit to long-term social involvement in the community.

- The combination of an expanded Alpine skiing facility (lifts and trails) and greatly enhanced and consistent skiing conditions would make the Snowbowl more attractive to destination skiers. This would enhance the Snowbowl as the Flagstaff area's primary winter attraction and increase dollars spent by non-locals in the community.

Alternative 3

As noted in other sections of this analysis, realistically, no owner/investor would undertake the full range of ski area projects envisioned under Alternative 3; this alternative does not make sense from a financial perspective. As such, the realistic impact of Alternative 3 would be similar to those for Alternative 1 – no significant change to the Snowbowl's recreational and social functions as summarized above.

In the unlikely event that Alternative 3 were to be fully accomplished, the recreational and social functions now associated with the Snowbowl would be placed in jeopardy. Completion of Alternative 3 would place the ski area in a perilous financial situation and business operations could potentially cease within several years. If this occurred, the Snowbowl's recreational and social functions would be lost. The Flagstaff area would lose its most significant Alpine recreation venue and the area population would lose a highly accessible portal to the mountains.

Indicator:

A Discussion of Snowbowl Business Activity and Its Relationship With Flagstaff Area Tourism, Winter Tourism and Trends in Local Taxes.

A number of the identified indicators address a series of interrelated issues. Specifically, this indicator addresses: 1) the role that winter tourism plays in the Flagstaff area economy; 2) how snowfall and Snowbowl visitation relate to broader winter tourism activity in the Flagstaff area; 3) the possibility of a correlation between Snowbowl

visitation and the BBB tax; and 4) how weather conditions affects tourism and the BBB tax.

The common thread running through this indicator is the role that the Snowbowl's activity plays in influencing the Flagstaff area tourism economy. More specifically, the indicator focuses on the question of whether Snowbowl activity is a major factor in year-to-year trends in tourism activity. The preceding economic analyses make it clear that the Snowbowl is a positive economic force in the region, in a number of ways: 1) the Snowbowl creates employment and generates significant economic output; 2) the Snowbowl draws visitors to the Flagstaff area who spend dollars at the ski area and at other area businesses; and 3) the Snowbowl offers a unique winter attraction in the Flagstaff area and plays a number of recreational and social roles in the community.

While the Snowbowl is clearly a positive economic contributor, even a cursory examination of the scope of the ski area operation in comparison with the full scope of the Flagstaff area economy makes it clear that the ski area is of insufficient size to be a dominant driver of trends in tourism or the broader economy. Thus, the issues posed by several of these indicators are essentially moot. A review of the issues and findings follows:

Several analytical exercises were completed to assess 'the percentage of Flagstaff's total economy represented by winter tourism in comparison with other major economic components of the community.' The table below shows the overall distribution of employment in Coconino County for 2002.[144]

[144] Arizona Dept. of Employment Security as made available on FlagData web site. Figures are averaged for 2002. Employment breakdown for City of Flagstaff alone were not available. However, total employment in the City of Flagstaff is approximately 35,500 persons, or 60.2 percent of the Coconino County total. The City is clearly the primary economic center in the county.

Table 3E-27
Distribution of Non-Farm Employment
Coconino County (2002)

	Annual Averages - 2002	
	Employment	**% of Total**
Goods Producing	**5,625**	**9.5%**
Natural Resources and Mining	125	0.2%
Construction	2,550	4.3%
Manufacturing	2,950	5.0%
Service-Providing	**53,325**	**90.4%**
Trade, Transportation, and Utilities	9,575	16.2%
Information	475	0.8%
Financial Activities	1,475	2.5%
Professional and Business Services	2,675	4.5%
Educational and Health Services	6,425	10.9%
Leisure and Hospitality	10,950	18.6%
Other Services	1,725	2.9%
Government	20,050	34.0%
Federal Government	3,500	5.9%
State and Local Government	16,550	28.1%
Total Private	***38,925***	***66.0%***
Total Nonfarm	***58,975***	***100.0%***

The three major sources of employment in the county are Government, Leisure & Hospitality and Trade/Transportation & Utilities. This is a service-based economy with Goods Producing sectors only accounting for 9.5 percent of total nonfarm employment. Manufacturing only accounts for one in 20 jobs (five percent.)

While the Leisure & Hospitality figure provides some indication of the significance of tourism to the area economy, this category alone does not account for tourism's full economic impact. Recent research on the Flagstaff area economy has attempted to quantify tourism as an economic sector:

- A recent research study assessed 'industry clusters' to assess how significant these clusters are to the area economy.[145] The term 'cluster' refers to a geographic concentration of interdependent companies, suppliers, products, labor pool and institutions that together constitute an important competitive advantage for a region. The study found that the 'Tourism Cluster' is the "leading economic activity in Coconino County." Further, the study found that the 'Tourism Cluster' accounted for the employment of 13,345 persons in 1996. Based on a 1996 average employment level of 54,500, the 'Tourism Cluster' accounted for 24.5 percent of the county's employment in that year.[146]

[145] Morrison Institute for Public Policy, January 2000

[146] County employment figure source: U.S. Bureau of Labor Statistics.

- A 2001 article sponsored by Northern Arizona University indicated that, "Directly and indirectly, tourism in Flagstaff accounts for more than 20 percent of all business in town."[147]

In summary, the research indicates that tourism (in total) accounts for 24.5 percent of Flagstaff's economy. During the most recent five years for which data is available, an average of 35.3 percent of Flagstaff tourism occurred during the winter months.[148] Since tourism in total is estimated to account for approximately 24.5 percent of the Flagstaff area economy, winter tourism can be estimated to account for approximately 8.6 percent of the Flagstaff area economy.[149] In comparison, recent research indicated that the Northern Arizona University "helps keep more than 8,000 people employed."[150] With total county employment of approximately 59,000, it can be estimated that the University accounts for approximately 13.6 percent of the Flagstaff area economy.

The 'historic relationship between winter tourism level in Flagstaff, annual snowfall and annual skier visitation at the Arizona Snowbowl' was analyzed from a statistical perspective with analyses of the three data sets. While snowfall and skier visit data are readily available from the Snowbowl, there is no absolute count of winter tourism visitors in Flagstaff. As such, a proxy for annual tourism was developed using available tax data. Specifically 'Hotel BBB Sales' and actual BBB tax revenue data were used to develop a proxy for tourism activity on monthly and annual bases.[151]

[147] Morlock, 2001.

[148] Tourism volume based on monthly BBB tax receipts. Winter defined as December through April – consistent with the typical Arizona Snowbowl operating season.

[149] 24.5% X 35.3% = 8.64%.

[150] Source: *Arizona's Universities: An Economic Engine for the State,* Arizona Board of Regents Web Site. This figure includes jobs generated on indirect bases. Direct employment is approximately 2,300 persons.

[151] 'Hotel BBB Sales' represent gross revenues at Flagstaff hotels that are subject to the BBB tax. BBB tax collections are actual BBB tax revenues. The BBB tax is a two percent tax on all lodging and restaurant/lounge sales in the City of Flagstaff. While 'Hotel BBB Sales' is a pure representation of lodging activity (including business travel) BBB tax revenues reflects a mix of restaurant/lounge and lodging sales. Source: Flagstaff Sales Tax Administrator.

Table 3E-28
Snowfall, Snowbowl Skier visits and Winter Tourism Proxy
Historic Data Sets

	Snowfall (Inches)	Skier visits	Winter Tourism Proxy
1990/91	233	106,000	1.945
1992	360	173,000	2.275
1993	460	181,000	2.315
1994	220	116,388	2.456
1995	259	176,778	2.592
1996	113	20,312	2.569
1997	270	153,176	2.580
1998	330	180,062	2.667
1999	150	35,205	2.548
2000	180	66,152	2.670
2001	272	162,175	2.656
2002	87	2,872	2.636
2003	206	87,354	NA

The variables were tested separately to determine if statistical relationships exist.[152]

- *Relationship of Skier visits to Snowfall* - there is a strong relationship with a coefficient of determination of 0.803, indicating that snowfall is a useful statistic in predicting skier visits 80 percent of the time.[153] This relationship is shown graphically below.

- *Relationship of Winter Tourism to Snowfall* - there is a minimal relationship with a coefficient of determination of 0.105, indicating that snowfall is a useful statistic in predicting winter tourism only ten percent of the time.[154]

- *Relationship of Winter Tourism to Skier visits* - there is a minimal relationship with a coefficient of determination of 0.029, indicating that skier visits are a useful statistic in predicting winter tourism only three percent of the time.[155]

[152] The analyses were completed using the 'linest' function in Microsoft Excel. Linest is a regression function that uses the 'least square' method to calculate a straight line that best fits the data. The primary linear relationship between the variables was assessed with the 'coefficient of determination' variable that results from the analysis. A coefficient of 1.0 would indicate a perfect correlation in the sample, while a value of 0.0 would indicate that the variables are not related. A value of 0.80 would indicate that the equation can predict the dependent variable 80 percent of the time and would be regarded as a positive indicator of a statistical relationship.

[153] Analysis completed on data for period 1990/91 to 2002/03.

[154] Id.

[155] Id.

- *Relationship of Winter Tourism to Combined Snowfall/Skier visits* - there is a small relationship with a coefficient of determination of 0.179, indicating that the combination of snowfall/skier visits is a useful statistic in predicting winter tourism 18 percent of the time. [156]

In summary, it is apparent that snowfall is a strong predictor of skier visits at the Snowbowl. However, neither snowfall nor skier visits are useful for projecting total winter tourism in Flagstaff. Without question, snowfall and skier visits do have impacts on winter tourism in Flagstaff. Snowfall brings skiers who make expenditures at the Snowbowl and in Flagstaff. However, skier visits are only one component of all of the tourism activity that occurs during the winter and because the impact of these skier visits is relatively small in absolute terms, it is not a useful predictor of total activity levels.

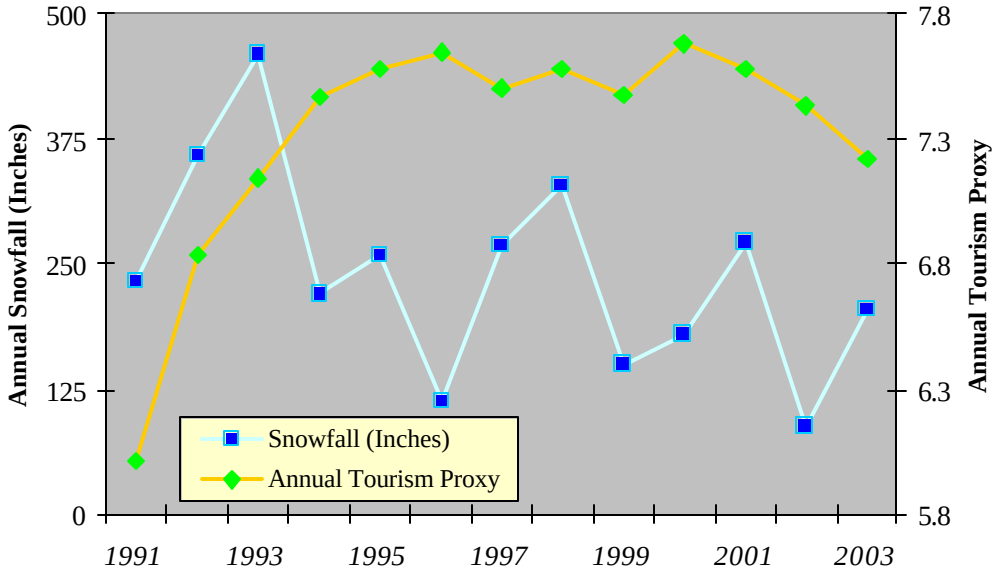
The issue of 'the effects of dry roads/fair weather on tourism in Flagstaff and the BBB' tax was assessed from several perspectives. The relationship between annual Flagstaff tourism (and the BBB tax) and dry roads was analyzed using several historic data sets. The presence or absence of dry roads was assessed using snowfall and precipitation data for the area. There is no absolute count of tourism visitors in Flagstaff. As such, a proxy for annual tourism was developed using available tax data, as described above. The data sets were combined to assess how tourism has varied from month-to-month and year-to-year over recent years. The variables were tested separately to determine if statistical relationships exist.[157] Results are summarized below.

- *Relationship of Flagstaff Annual Tourism to Snowfall* – if dry roads were assumed to have a positive impact on Flagstaff tourism, then a high snowfall year would be expected to have a negative impact on tourism volume. The relationship between annual snowfall and Flagstaff's annual tourism volume is shown in the following graphic.

[156] Id.

[157] The analyses were completed using the 'linest' function in Microsoft Excel.

Figure 3E-5
Relationship of Flagstaff Annual Tourism and Annual Snowfall

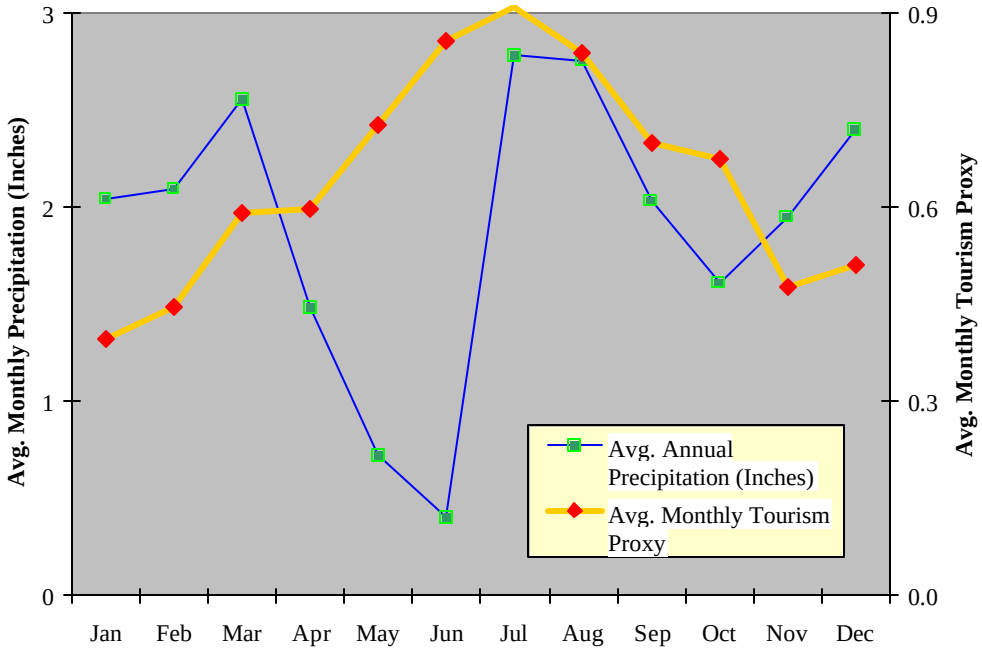


There is no obvious relationship between snowfall and Flagstaff tourism. The two lines do not move in concert or in opposition to one another. The statistical analysis indicates there is minimal relationship between the two factors with a coefficient of determination of 0.063, indicating that snowfall is a useful statistic in predicting annual Flagstaff tourism only six percent of the time.[158]

- *Relationship of Flagstaff Tourism to Precipitation* – if dry roads were assumed to have a positive impact on Flagstaff tourism, then tourism volume would be higher in months with minimal precipitation and lower in months with higher precipitation. The relationship between average monthly precipitation and average variation in Flagstaff's monthly tourism volume is shown in the following graphic.

[158] Analysis completed on data for period 1990/91 to 2002/03.

Figure 3E-6
Relationship of Flagstaff Monthly Tourism and Monthly Precipitation



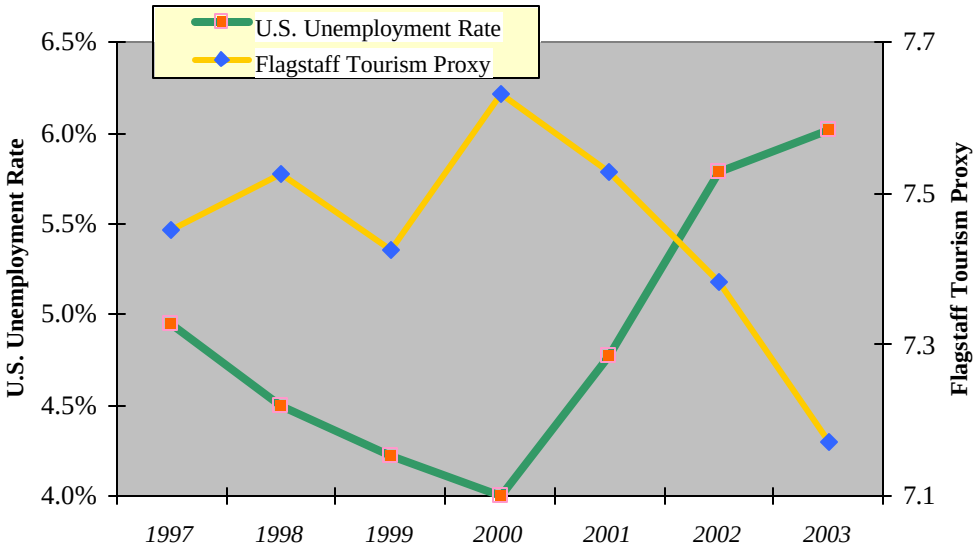
There is no obvious relationship between the two variables. While declining precipitation appears to relate to increasing tourism in May and June, tourism is at its highest level in the month with the highest average precipitation (July). The statistical analysis shows a minimal relationship between the two factors with a coefficient of determination of 0.018, indicating that monthly precipitation is a useful statistic in predicting monthly Flagstaff tourism only two percent of the time.[159]

The data analysis suggests that, over the years, dry roads/wet weather bears little relationship to Flagstaff tourism volume and thus the BBB tax. While short-term events, such as a major snowfall, can clearly affect tourism volume over a period of several days, the reality is that with only 22.8 inches of precipitation annually, the impact of bad weather is limited to a small segment of the year.

Total tourism volume is more closely linked to the economy than to isolated weather events. The following chart shows annual Flagstaff tourism volume compared with the U.S. unemployment rate.

[159] Analysis completed on precipitation data averaged over 30 years. Monthly tourism data averaged for most recent four years.

Figure 3E-7
Relationship of Annual Flagstaff Tourism to U.S. Unemployment Rate



Flagstaff tourism volume generally tended upward during a period of a decreasing U.S. unemployment rate (1997 to 2000), while tourism volume declined during a period of an increasing U.S. unemployment rate (2000 to 2003).[160] In conclusion, the macro economy has far more impact on Flagstaff tourism than do weather events.

Finally, the potential correlation between Snowbowl skier visitation and the Bed, Board & Booze tax was assessed. The BBB tax is a two percent tax collected on all purchases at local restaurants, lounges, hotels and campgrounds in Flagstaff. The Snowbowl does not collect the BBB tax, as it is not located in Flagstaff. However, Snowbowl's visitors have a direct impact on the tax by purchasing lodging and food & drink in Flagstaff as part of their trip to the Snowbowl. Day Visitors make stops at Flagstaff restaurants and lounges on their way to and from the Snowbowl, while Destination Visitors eat meals at Flagstaff restaurants, drink at lounges and use lodging facilities.

Given these expenditure patterns, Snowbowl visitors directly generate BBB tax revenues within Flagstaff. The current level of BBB annual tax generation by Snowbowl visitors has been estimated as follows:[161]

1. Estimate total expenditures made by Snowbowl visitors outside the resort as described above. These expenditures are in four categories – Eating-Drinking-Entertainment, Retail, Hotel-Lodging and Services. This total is currently estimated to be $5.63 million.

[160] The coefficient of determination for the two variables is 0.700 – showing a positive relationship.

[161] Estimates are for winter visitors to the Snowbowl only.

2. Adjust for spending categories relevant to the BBB tax. Two categories are relevant to the tax - Eating-Drinking-Entertainment and Hotel-Lodging. Current expenditures in these categories are estimated at $2.63 million annually.

3. Adjust for the percentage of these expenditures that are made in Flagstaff. Flagstaff is the urban center in the region and contains the great majority of the region's commercial establishments. Further, major travel routes to and from Snowbowl go through Flagstaff. It has been conservatively estimated that 75 percent of the relevant expenditures are completed in Flagstaff. These expenditures currently total $1.97 million.

4. Calculate the tax generated by Snowbowl visitors by multiplying relevant Flagstaff expenditures by the two percent tax rate. On this basis, it is estimated that Snowbowl visitors currently generate $39,460 in BBB tax on an annual basis.[162]

The calculations indicate that Snowbowl visitors make a positive contribution to BBB tax collections. Because this is an economy of significant size, BBB tax generated by Snowbowl visitors constitutes a small portion of total tax collections. This is shown in the table below.

Table 3E-29
BBB Tax Collections Generated by Snowbowl Visitors as a Percentage of Total BBB Tax Collections

	Annual	Winter (Dec - April)
Total BBB Tax	$3,771,646	$1,347,104
BBB Tax Generated by Snowbowl Visitors	$39,460	$39,460
Percentage of Total Tax Generated by Snowbowl Visitors	1.05%	2.93%

These findings are consistent with previous statements that the Snowbowl is a positive generator of economic activity, providing jobs and wages, but is not a major driver of the Flagstaff area economy.

Given the small segment of the BBB tax generated by Snowbowl visitors, it is unlikely that overall BBB tax collections would have a significant correlation with business activity at the Snowbowl; Snowbowl related collections constitute too small a percentage of total collections. Statistical tests assessing the relationship of Snowbowl visitation

[162] This is an average figure and varies substantially from year-to-year in direct proportion to skier visits at the Snowbowl.

with BBB tax collections showed no significant relationship between the two variables.[163] While the tests show no significant relationship, it remains significant that Snowbowl visitors generate BBB tax. Increases in ski area visitation would result in additional visitor expenditures in Flagstaff and increase BBB tax collections.

Alternative 1 – No Action

Under Alternative 1-No Action the Snowbowl would continue to have a role as a positive contributor to the Flagstaff area economy by virtue of job maintenance, expenditures by visitors at area businesses, the ski area's recreational/social functions and tax payments made at Federal, state and local levels. However, the Snowbowl's current business situation is tenuous, as financial losses have been experienced in a number of recent years. Continuation of the current operation as a for-profit business may not be sustainable; the ski area would likely decrease expenditures on maintenance and non-essential services leading to an overall reduction in the quality of the services offered. In either event, the Snowbowl's contribution to the area economy would be reduced.

Under this alternative, winter tourism as a segment of the Flagstaff area economy would not change and the relationship between snowfall, skier visits and total winter tourism would remain at a minimal level. Total tourism volume in the area would continue to respond primarily to macro economic events. The alternative could result in additional BBB tax generation of approximately $4,500 annually, but would not significantly alter the current relationship between the BBB tax and Snowbowl visitation.

Alternative 2 – The Proposed Action

Under Alternative 2-The Proposed Action, the Snowbowl's role as a positive contributor to the Flagstaff area economy would be enhanced. The alternative would result in new jobs being created both directly and indirectly, would generate additional visitor dollars at area businesses, would enhance and solidify the ski area's recreational/social functions and would increase tax payments at Federal, state and local levels. These additional tax payments would provide additional support for programs and services.

Under this alternative, winter tourism as a segment of the Flagstaff area economy would increase, as the additional activity at the Snowbowl would generate additional winter tourism dollars. The current strong relationship of snowfall to Snowbowl visitation would decrease in significance, as the Snowbowl would be able to offer quality skiing and snowtubing with or without snowfall – as a result of the inclusion of a snowmaking system. Total winter tourism would increase in response to more visits at the Snowbowl. However, total tourism volume in the area would continue to respond primarily to macro economic events. The alternative would result in additional BBB tax generation of approximately $59,000 annually, thus strengthening the relationship between Snowbowl

[163] Linear correlation analysis was used to assess three potential relationships using data from 1990 forward to the most recent year: 1) Annual skier visit totals with annual BBB collections; 2) Annual skier visit totals with ski season (December through April) BBB collections and; 3) Monthly skier visits with corresponding month BBB collections. The coefficient of determination statistic in each instance showed minimal relationships between the two variables. In addition, a test was completed to see if variations from skier visit monthly medians have a relationship with variations from the median for BBB collections. Again, no significant relationship was shown.

visitation and the BBB. However, the BBB would continue to respond primarily to broader tourism and economic events.

Alternative 3

As noted above, it is highly unlikely that an owner/investor would all of undertake the ski area improvements included in Alternative 3. As such, the effects of this alternative would effectively be the same as those summarized above for Alternative 1-No Action. Any improvements completed under this alternative would be minor and would not significantly affect existing weather, visitation, tourism and BBB tax relationships.

In the unlikely event that the alternative's improvements were to be completed, it is likely that the Snowbowl's current positive economic contribution would be lost, as it is likely that the ski area would cease business activity within several years.

CUMULATIVE EFFECTS

Scope of Analysis

Temporal Bounds

For the purpose of this cumulative assessment, it is assumed that Social and Economic Resource effects within the greater Flagstaff and Coconino County areas began with the original development of ski area facilities in the late 1930s, increased with approval an implementation of projects analyzed in the 1979 EIS, continue to the present day, and will extend into the foreseeable future.

Spatial Bounds

The affected environment relevant to a discussion of cumulative affects for Social and Economic Resources includes the greater Flagstaff and Coconino County area.

Past, Present, and Reasonably Foreseeable Future Actions

Past, present, and reasonably foreseeable projects with potential to cumulatively affect Social and Economic Resource include:

1. Residential and summer home development in Hart Prairie
2. Snowbowl Wireless Telephone Communications Site
3. San Francisco Mountain Mineral Withdrawal
4. Transwestern Lateral Pipeline Project
5. Miscellaneous/ongoing recreational uses

All of these projects are within the spatial extent of the cumulative impact area, but are not of an extent or development scale sufficient to have significant cumulative effects. Appendix C includes the full list of past, present and reasonably foreseeable future actions analyzed in this document, as well as background information on each of them.

Alternative 1 - No Action

Past and present development of home sites has occurred independently of specific ski area development. While an intuitive correlation between specific ski area development activities and ongoing development in Hart Prairie may exist, there is no meaningful method of identifying a direct relationship between the two.

The extent to which this withdrawal will affect Social and Economic Resources in the area is speculative, in that entities which would have potentially been interested in pursuing mining activities are unknown. There are no known or suspected deposits of precious ore within the withdrawn area. However, a pumice mining operation recently ceased in the vicinity.

From a cumulative effects perspective, the construction and operation of the pipeline is considered negligible.

The general pursuit of recreation activities contributes to the overall flagstaff economy. However, as detailed within this Social and Economic Resources analysis, the Flagstaff and Coconino County area is generally large enough that recreation actives are only a minor contributor to the overall economy. Cumulatively, the addition of past, present and foreseeable non-skiing recreation activities is anticipated to have an immeasurably minor effect on the area economy.

None of the identified past, present or reasonably foreseeable activities would combine with the effects anticipated under the No Action Alternative to create any significant cumulative social or economic resource impacts.

Alternative 2 – The Proposed Action

None of the identified past, present or reasonably foreseeable activities would combine with the effects anticipated under the Proposed Action to create any significant cumulative social or economic resource impacts.

Alternative 3

None of the identified past, present or reasonably foreseeable activities would combine with the effects anticipated under Alternative 3 to create any significant cumulative social or economic resource impacts.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Because all projects analyzed in the analysis of socioeconomic resources are proponent-driven and financed, no irreversible or irretrievable commitments of economic resources were identified.